A

MANUAL

OF

BANDAGING.

ADAPTED FOR SELF-INSTRUCTION.

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PREFACE TO THE SECOND EDITION.

Horace Greeley, in his "History of the American Conflict," wrote his preface under the caption of "Preliminary Egotism." This being of necessity the very nature of *all* book prefaces, the Author of A MANUAL OF BANDAGING would hereby acknowledge the pleasure he has received from the kindly reception awarded the first edition of his Book. Not only have Physicians, in private letters to the Author, commended the work very highly, but the Medical Press has been equally generous in its bestowal of praise. Prominent Professors in various Medical Colleges have also included it among the text-books recommended to their students. To all of these kind friends the Author would now return his thanks.

This *second* edition of the MANUAL has been enlarged by the addition of fully one-fourth of new matter, and new illustrations. The chapters most largely added to have been those devoted to the "Bandages of the Upper Extremity," "Bandages of the Lower Extremity," and "Immovable Dressings;" though most of the other chapters have received additions of new matter and new illustrations as well. So, too, some of the old cuts have been discarded, and new and better ones have been put in their places.

The general classification, and manner of description, as given in the previous edition, has been retained; this will be found fully described in the following Preface.

To the various medical gentlemen who have assisted him in the preparation of this new edition, by criticism and new matter furnished; and also the instrument house of John Reynders & Co., for the loan of cuts to illustrate the portion devoted to the description of Professor Sayre's "Spinal Apparatus," the Author would now tender his thanks, sincerely hoping this new edition of his book will be found as worthy of commendation as the first.

C. H. L.

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PREFACE TO THE FIRST EDITION.

In the issue of this little MANUAL the author has hoped to meet the wants of many students of medicine, and practitioners who have had no opportunities for hospital drill in bandaging.

Our text-books, in general, are very meagre in their descriptions and illustrations of this branch of surgery, and our "Lectures," given upon this topic at our medical colleges, are too often cursory and incomplete, from the press of, seemingly, weightier matters that demand attention. We have, the author believes, no work in the English language that is devoted exclusively to this subject. Several works upon "Minor Surgery," in reprints and original editions, are seen upon our book shelves; yet even these offer but few descriptions, and have fewer illustrations—really the essential part of all treatises upon this art—of the various bandages.

In this work each bandage is designed to have an illustration of its application. There are but a few exceptions to this rule, and these all are either referred to a wood-cut that answers the purpose sufficiently well, or else the bandage is so exceedingly simple that none is required.

It will be noticed, also, that but few "double-headed" bandages are given. It has been the purpose of the author to omit these so far as possible; thus making the book consist of the simple and more useful bandages, rather than those after the "fancy" and ornate order.

A glance at the Table of Contents will show the extent of ground gone over, and the completeness, or incompleteness of its consideration. "Knots," "Poultices," "Strappings," and "Immovable Bandages," are so intimately connected with the subject treated of at length, that it was thought advisable to introduce a few short chapters upon these topics.

Gerdy's classification has been, in the main, followed for the Roller bandages, and Mayor's for the most of the Triangles and Cravats, though the author has adopted dressings from other sources as well. He is also under great obligations to Professor John H. Lowman, of the Medical Department of the University of Wooster, Cleveland, Ohio, for original matter and designs received, besides many other courtesies extended to him.

Thanking his other various friends for advice and assistance given, he awaits with interest the MANUAL'S reception by the medical public.

C. H. L.

January 1st, 1876.

CONTENTS.

CHAPTER VII.

CHAPTER VIII.

CHAPTER IX.

CHAPTER X.

CHAPTER XI.

CHAPTER XII.

CHAPTER XIII.

LIST OF ILLUSTRATIONS.

A MANUAL OF BANDAGING.

CHAPTER I.

UPON CATAPLASMATA.

HOW TO MAKE A POULTICE.

Linseed meal is the substance usually selected for the basis of cataplasmata. We find this meal in the shops in two forms: 1st, the "crushed;" 2d, the "ground." The former is frequently employed, though it is not as handy to use as the "ground," which is the finer, adheres less to the integument, and retains its heat the longer, and takes up a larger amount of water.

A sufficient quantity of the meal having been measured out, pour upon it *boiling* water, in small quantities at a time, stirring the mass, meanwhile, thoroughly with a spatula or spoon. Keep adding the water till the mass assumes the consistency of thick cream; it is now ready for "spreading."

HOW TO SPREAD A POULTICE.

The batter of the poultice having been prepared, it is necessary to have a piece of thick cotton cloth, or linen, two or three inches wider than the surface you wish to cover with the cataplasm. Spreading this smoothly out upon a flat surface, you pour the batter upon it, and with a spatula you spread it, to a proper thickness, evenly over the cloth, having care that it does not come to within an inch or two of its edge. You then fold each edge of the cloth evenly over the edge of the applied batter, thus leaving a clean, neat margin to your cataplasm, as well as effecting a sort of a confinement of the batter to the cloth. You now spread a very thin piece of muslin (the thinner the better) over the whole surface of the poultice;

this prevents any of the meal from drying upon your patient's person, and ensures him a neat, clean and comfortable dressing.

Some surgeons, however, prefer a coating of sweet oil over the spread poultice-batter to the thin piece of muslin. This also keeps the meal from adhering to the skin.

HOW TO APPLY A POULTICE.

Everything being in readiness, the poultice is lifted from the table, and *one end* gently laid upon the tender and inflamed surface, and the remainder of the poultice suffered *gradually* to cover over the diseased member; with this little care you will often save your patient much needless pain and suffering, that would else be caused by "slapping" your dressing upon a tender and sensitive part. The same gentleness should be used in lifting a poultice; otherwise, from the quick relief of pressure, a severe throbbing pain will ensue.

After the cataplasm has been properly placed, it, and a portion of the member, should be covered with a piece of oil-silk, thin table oil-cloth, or oiled muslin, and over this should be thrown a layer or so of flannel, or thin layer of cotton-wool, the whole, finally, being lightly confined by a proper bandage. The oiled silk, or muslin, serves a double purpose: that of confining the heat and moisture to the part, and of protecting the bed clothes, or clothing, from the water in the poultice-batter.

MEDICATED POULTICES.

The linseed-meal poultice, as just described, may be medicated with various substances, as occasion requires. Thus, if an *anodyne effect* is desired, sprinkle over the top of the poultice, when spread, a teaspoonful of tincture of opium, or a grain of morphine.

If *an astringent effect* is desired, a little sulphate of zinc, or pulverized alum, should be dissolved in the water of which the batter is made.

If *a disinfectant action* is wished, carbolic acid can be added to the water of which the poultice-batter is made. Other

medicines may also be incorporated in the water, as the occasion may seem to demand.

CATAPLASMA CARBONIS—(*Charcoal Poultice*).

FORMULA.*—Take of wood charcoal, in powder, one-half an ounce; bread crumbs, two ounces; linseed meal, one and one-half ounces; boiling water, ten fluid ounces. After macerating the bread in the water for ten minutes before the fire, mix well, and then gradually add the linseed meal, and intimately incorporate this with the mass. To this add one-half the charcoal, stirring it well in, and then sprinkle the remaining charcoal upon the surface of the cataplasma, when spread.

The bread is not a necessary ingredient of this poultice, though advised by the *Pharmacopœia.* It is quite as well if dispensed with, and the poultice is so made by most American dressers.

If the water is taken at the temperature of boiling, as the *Pharmacopœia* recommends, the poultice, when spread, is generally of as sufficient high temperature as the part can well stand. Should the poultice have become cool, however, it should be heated by placing upon a stove, hot-air or steam-pipes.

Uses.—In a general way all poultices have the same use; that of retaining warmth and moisture to a part, thus accelerating sloughing and the discharge of inflammatory products; also that of protecting the surface from the air, and changes of temperature. Besides these more general uses, each kind may have a specific purpose of its own, as in case of the poultice under consideration. A charcoal poultice is, in fine, an antiseptic and disinfective poultice. The *Pharmacopœia* has recommended *wood* charcoal; animal is still better, as it has greater power for absorbing the infecting material thrown off in the slough. It prevents noisome odors from foul, or gangrenous surfaces, by absorbing the gases. It must be frequently applied, and should be used in all cases of gangrenous ulceration.

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* NOTE.—The Formulæ of most of these cataplasms are taken from the *British Pharmacopœia.*

CATAPLASMA CONII—(*Hemlock Poultice*).

FORMULA.—Take of powdered hemlock leaves, one ounce; linseed meal, three ounces; boiling water, ten fluid ounces. Mix the hemlock and meal intimately together, and then gradually add the water, constantly stirring.

Uses.—As an anodyne dressing for cancerous and syphilitic ulceration. As there is danger of the drug being absorbed too freely from the wounded surface, the patient should be watched closely that no poisonous symptoms may arise.

Opium and Belladonna may also be made use of in making these anodyne dressings, using them, however, in much smaller amounts than is recommended to be taken of the conium.

CATAPLASMA FERMENTI—(*Yeast Poultice*).

FORMULA.—Take of beer yeast, six fluid-ounces; wheat flour, fourteen ounces; water (100° F.), six fluid ounces. Mix the yeast with the water and stir in the flour, afterwards placing the mass before the fire till it rises.

Uses.—As a sort of an anodyne poultice. The carbonic acid gas evolved has something of an anæsthetic effect upon the inflamed skin. It corrects the fetor of the discharges, and stimulates indolent ulcers. The dressing is not now much made use of.

CATAPLASMA SINAPIS—(*Mustard Poultice*).

FORMULA.—Take of powdered mustard-seed and linseed, each, two and one-half ounces; boiling water, ten fluid-ounces. Mix the linseed meal gradually with the water, and then stir in the mustard.

Uses.—More especially as a rubefacient. The *Pharmacopœia* has directed that boiling water be used. It would be better not to employ water at so high a heat, as it deteriorates its rubefacient power in some varieties of mustard. The laity often make an addition of vinegar; but this is a mistake, in case the *black* mustard be used, as it defeats the very action it was put in to enhance.

Care should also be had in the application of this rubefacient to the very young or very aged; for if left too long applied, epidermal sloughing may occur.

CATAPLASMA SODÆ CHLORINATÆ—(*Chlorine Poultice*).

Formula.—Take of solution of chlorinated soda, two fluid-ounces; linseed meal, four ounces; boiling water, eight fluid ounces. Mix the linseed meal, gradually, with the water, then add the solution of soda, with constant stirring.

Uses.—This is properly a disinfectant application, and makes a most excellent dressing for foul and gangrenous ulcers.

Carbolic, or, perhaps better, Salicylic acid, is a useful adjuvant to the common linseed, and bread-and-milk poultices, having both an antiseptic and disinfectant action, besides a therapeutical and anæsthetical one. Tar is also sometimes incorporated in these styles of dressings, and makes an important ingredient in a certain class of eczematous cases.

CATAPLASMA PANIS ET LACTIS—(*Bread-and-Milk Poultice*).

Description.—Take the inside of a loaf of stale bread, crumble it well up in eight or ten ounces of sweet milk, and, after soaking a few minutes, let it come to a boil, and then stir in a bit of lard, or a few drachms of sweet oil.

Uses.—As an emollient dressing. Anodynes may be added as suits the case. Is not a very commendable poultice, as, from the heat, etc., of the inflamed part, the milk soon becomes rancid.

POULTICE OF OAKUM.

Description.—Take a sufficient quantity of oakum, loosely picked, and place in a thin piece of muslin, and wrap loosely up, then immerse the whole in boiling water. It is then wrung out and covered by a thin layer of muslin, and is thus to be applied to the member diseased, with oiled-silk over it all.

Uses.—As an antiseptic and absorptive dressing. The water may be charged with antiseptics or anodynes.

CHAPTER II.

ON CHARPIE—COTTON-WOOL.

Of this there are four kinds, viz., *raw*, *long*, *rasped* and *web-like*. But one of these, the *raw*, is of moment.

This is made by picking apart the threads of a piece of linen, each filament having a length from 2 to 3 inches; if they are too short, the filaments are apt to *mat* or *lump* together, and so render it unfit for the uses for which it was intended. A good article should be white, soft and light, and somewhat elastic.

The difficulty of procuring a properly prepared charpie, and of keeping it free from matting has, at present, induced most surgeons to substitute for it clean cotton-wool.

Charpie, or cotton-wool, is used in surgery to protect from irritation, to compress, and to slightly irritate, as well as to maintain in equal temperature a wounded member: one of its most common uses is, however, as an absorbent of the secretions from a wounded surface. For these multitudinous uses it is employed under the form of *plumasseaux*, *gateaux*, *boulettes*, *bourdonnets*, *tampons*, *pelotes*, and layers, or *laminæ*.

A Plumasseau (*a pledget*)—is but a bunch of charpie which has been drawn, lengthwise, lightly through the fingers till the filaments of the mass are made parallel with each other, and the mass made of the same thickness and density throughout. It may be used as an absorbent of secretion, for slight compression, or for carrying medicaments to a wounded surface.

A Gateau (*a cake*)—is nothing more or less than a large plumasseau, with the ends of the charpie folded into the centre of the mass. It is used more especially for compression, and for absorbing the secretions of the wound.

A Boulette (*a little ball*)—is simply a ball of charpie, formed by rolling little masses of it in the palms of the hands.

Boulettes should be soft, elastic and loosely made. Are used for cleansing, or as carriers of sundry medicaments.

A Bourdonnet (*a dossil or lump of lint*)—is a small plumasseau tied closely around the middle, giving it an hour-glass shape. Used as a compress, or as a slight tampon in cases of hæmorrhage.

Tampon (*a plug*)—is a large *bourdonnet* and prepared in the same manner as the preceding. Other forms and varieties are in use; as the vaginal, rectal, etc. The two latter are, perhaps, best prepared from pieces of lint, 3 or 4 inches square, soaked in water, then introduced singly, and "crowded closely home." Sometimes, as in lithotomy, wounds of the rectum, etc., we wish to make strong *lateral* compression; here use a tampon formed over a female (metal) catheter, by fastening the slotted end of the instrument securely to the center of a piece of lint 8 or 10 inches square; introduce this into the wound, retaining the corners of the lint at the surface. When introduced, pack your charpie, or lint, or cotton-wool, closely around the shaft of the catheter, between it and the surrounding piece of lint, till you get the requisite amount of compression. This form of a tampon can be successfully used in these cases, as the lint (fastened to the catheter) prevents the escape of the charpie, or other packing substance, up the gut (in the case of rectal use), or beyond the point where pressure is desired to be made.

A Pelote (*a ball, or pin-cushion*)—is formed by tying firmly a wisp of charpie in a piece of lint, giving it something the shape of an old-fashioned pin-cushion, as made over a broken lamp-stand. Uses: bound over the course of an artery, it serves to arrest, for the time being, the flow of blood through it. It also serves the purpose of a tampon in certain cases of hæmorrhage.

Tents—have also been made of charpie by taking the long fibres of it, doubling in the middle, and then crowding it into the wound. But in our day of sponge tents, and the *laminaria digitata*, such a use of it will not be thought of, save in a case

of emergency, when the manufactured tents are not at hand.

The most of the above articles of dressing are now made from what is generally known as "surgeon's lint" (see Chapter III). Still, some surgeons prefer the charpie, or even oakum dressing, to any other. The oakum is preferable in case an antiseptic surgical dressing is desired.

CHAPTER III.

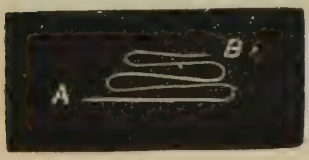
ON COMPRESSES.

These are best made of the "surgeon's lint" cloth, as it gives a more smooth, even and regular pressure. Their forms and sizes are almost innumerable, the surgeon using what the exigencies of the case may demand; yet, the following brief classification may prove of service. I start with the most simple:

The Square.—Its name indicates its peculiarity of form; it may be of a rectangular piece of the "surgeon's lint," folded in the middle to make a square, thus being double thickness; or, it may be built up of a succession of smaller pieces to a pyramidal form, forming the *graduated pyramidal compress.* If each successive piece is of the same size as the first, it forms the *graduated regular compress.* In either of the two latter forms, it should be stiched, through and through, in two or three places, so as to prevent the pieces becoming displaced.

Perhaps a simpler way of forming a graduated compress is the following: Cut quite a long piece of the "lint" of the width of the compress desired, then placing one end of the fragment flatwise on the table to the extent of the size wanted in a logitudinal direction, fold it over upon itself, reversing the motion of the hand, till you reach the initial edge of the first layer; here fold over again, reversing the motion of the hand, and so on. Fig. 1 will give an idea of the manœuvres indicated, as the compress is seen on an exaggerated perpendicular section. A is the initial, B, the final end. In this case some stiches will be needed to confine the folds securely.

FIG. 1.



The Triangular and **Rectangular** are but modifications of the above, and need no further description.

The Circular is, as its name indicates, a circular piece of "surgeon's lint." We have three varieties of the circular compress: 1st, the *clipped;* 2d, the *perforated;* and 3d, the *graduated.* The first is the ordinary kind, the edges being clipped inwards to a sufficient extent that it may lie smoothly on a part. The second variety admits of any modification desirable in the position, form, or extent of puncture or cut. The third is essentially formed in the same manner as the others of its class.

The Complex.—Under this head all perforated and fenestrated compresses, and those of two or more heads, are meant to be included, whether they are rectangular or square.

A Compress of Two Heads is simply a common compress, with one end split at the centre, as you see in Fig. 2.

Fig. 2. Fig. 3. Fig. 4.

One of Three Heads.—A common compress with one end split into three equal or unequal parts, as seen in Fig. 3.

A Sling Compress is a common compress having each end split at the middle, as seen in Fig. 4. It is also known as *a compress of four heads.*

A Compress of Six Heads.—This is a compress similar to *one of three heads;* the difference being that *both* ends are split into three equal or unequal parts.

The Button-hole Compress is one that has two or more slits through its centre, as seen in Fig. 5.

The Perforated Compress is one that has been, as its name implies, filled with small perforations, either by means of a stylet, or small punch, or by having pieces snipped out by the scissors. Fig. 6 will give you an idea of this. Is especially useful as a dressing for a *freely* suppurating surface.

FIG. 5.

FIG. 6.

The Uses of these various compresses are still more varied than their multiplicity of forms. The demands of the case must be met, by the ingenuity of the surgeon, in devising something appropriate; and, having a knowledge of these more generally used forms, he can choose the one that will be most subservient to his purpose, or modify it to suit the exigencies of the case.

CHAPTER IV.

ON BANDAGES IN GENERAL.

Hippocrates has said that, in bandaging, there is a two-fold purpose to be kept in view, viz., "that which regards it while doing, and that which regards it when done. It should be done quickly, without pain, with ease, and with elegance; *quickly*, by dispatching the work; *without pain*, by being readily done; *with ease*, by being prepared for everything; and *with elegance*, so that it may be pleasing to the sight."

There could, perhaps, be no more terse, yet comprehensive, rules to be kept in mind as regards bandaging than these offered by that great medical sage nearly twenty-five hundred years ago. And yet, how often, in the drill our students receive in their class-rooms, has this exercise been deficient both in the teacher and in the taught. Yet, to the surgeon, a smoothly, rapidly applied bandage, aside from its extreme usefulness, has an element of beauty about it that is not readily forgotten. It begets confidence, too, in your patient, in his friends, and adds greatly to your professional reputation. Hippocrates appreciated this, and instructed *his* pupils thoroughly in the minutiæ of the art. To-day it is almost wholly neglected, and even if spoken of at all, is dismissed as hurriedly as possible from the thoughts of faculty and students.

Hippocrates further adds: "The form of the bandage should be suitable to the form and affection of the part to which it is applied. The force of the constriction should be such as to prevent the adjoining parts from separating, without compressing them much, and so that the parts may be *adjusted* and not *forced* together." He further adds, after treating of the subject quite exhaustively, that "the bandages should be clean, light, soft and smooth. The heads of the bandages should be hard, smooth and neatly put on." This, coming from such antiquity, and agreeing with the hospital experiences of the last twenty-three hundred years, should be enough to recommend it to your most earnest consideration.

The Maltese Cross.—This is formed from a square piece of surgeon's lint, by cutting up from each corner two-thirds of the way towards the centre of the piece, giving you, when completed, the form seen in Fig. 7. Another way of forming it is, to double the square piece of lint at its middle, then, transversely to this fold, double it over again; this gives you four thicknesses of the lint. This done, cut diagonally across this small square, to a distance of two-thirds of the length of the diagonal, beginning at the four *free* corners of the folded lint. On unfolding, you will find you have a regularly and evenly made cross of this pattern.

Fig. 7.

Maltese Cross.

Uses.—Most generally employed in stump- and joint-dressings, as it readily adapts itself to all *convex* surfaces, the corners smoothly folding over each other, as it is applied.

A Roller—is the term given to our common narrow bandage; probably because to be used, it must first have been rolled smoothly and nicely up. Fig. 8 shows you the bandage, or roller, as ready for use. The part A is known as the *head;* the part B is the *initial end.* Fig. 8 is therefore *a roller with one head*, and is classed as a *simple* bandage.

Fig. 8.

Rollers may be of either one or two heads, at pleasure. In case of the latter the second head is formed by rolling up the initial end (B, in the cut) the same as the head A has been rolled. However, as a double-headed has no advantage over the single-headed roller, save in the bandage known as "the recurrent of the head," and a few others, I shall dismiss it, with but few exceptions, from this work. A single-headed roller is much more easily applied, looks just as well, and, in most cases, even answers the purpose better.

Our single-headed roller has, then, besides the initial end and head, a *plane*, C; an *internal surface*, C; an *external surface;* a *superior* and an *inferior border.*

How to make a Roller.—Rollers are generally made of flannel. In some delicate operations where "heating" of the wound, or the contiguous surface, is feared, linen or cotton has taken its place. The two latter substances never apply so evenly or smoothly as the flannel, as there is little or no elasticity in them. On the contrary, both edges of a flannel roller will lie smoothly upon a part if properly applied—a result difficult to be obtained on the use of a linen or cotton roller; that is, if the surface be anywise irregular or uneven. Farther than this, the stimulus, from pressure to a part, that flannel often gives, through its quality of elasticity is a great *desideratum* in most cases that require a bandage. Then, too, if the part should swell, the bandage gives; if the swelling be reduced, the bandage, in great measure, accommodates itself to this change, "support" thus being continually kept up; two other important qualities that are lacking in the linen or cotton roller. Of course the two latter have a plea of "cheapness,"—of doubtful consideration, however, when the comfort (present and future) of the patient is at stake.

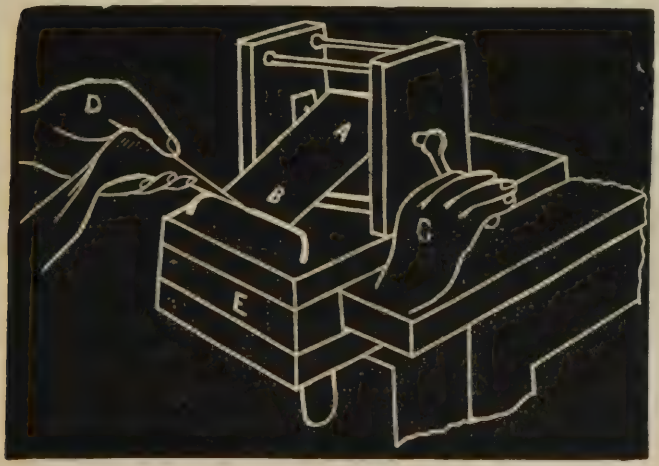
Tearing the Bandage.—It would seem almost superfluous to speak of such a small affair; yet, if one has many bandages to roll, it is an important item to save as much time as possible. Having, then, the cloth in its width as it comes from the store, notch it at the points that will give you the width of bandages desired; this done, give to an assistant each alternate strip, you holding the others in your hands. Then, with a long and steady pull, the whole bolt of cloth is divided, in a moment, into bandages of the widths desired.

The flannel having been torn into proper strips, as regards length and width, one end is taken and doubled over eight or ten inches upon itself; this doubled portion again doubled upon itself, and this again upon itself, until it is in proper shape for "rolling," or winding. This is started by gently rolling the doubled portion between the palm of the hand and table, or knee, as the case may be, until three or four turns are taken; then the roll is grasped between the thumb and forefinger (the second finger assisting if need be) of the *left* hand, the *external* surface (Fig. 9) of the bandage being *up*. The unwound portion is grasped by the right hand and allowed to fall in between the

thumb and forefinger, as seen in Fig. 9. (Some surgeons prefer to have it fall in between the first and second fingers, the thumb crowding in closely to the "head" of the bandage.) This done, holding the bandage quite firmly, yet loosely enough to slip, between the thumb and finger, the thumb hugging tightly the "head," by a downward or supine motion of the right hand, you partially circle the forming roller-head, the ring-finger sliding over it as a guide. This done, grasp the roller-head firmly with the right hand (by pressing it against the ball of the thumb with the second and third fingers), pronate the hand as far as possible, then confide the grasp of the roller-head to the thumb and fingers of the left hand, to go through with the same manœuvres as before. In all of these motions the *left hand* is to be perfectly immovable, the right performing all the work, save the simple holding of the roller-head when the right is making its supination around it. Although beginning these motions slowly, you can soon increase their rapidity until you can "roll" a bandage with surprising quickness. As soon as the "catch" to it is mastered, it is easily and rapidly done.

Fig. 9.

Fig. 10.



Instead of trusting solely to the hand-rolling of bandages some hospitals now make use of a rolling machine, similar to that shown in Fig. 10. In the cut there is shown the clamp, E, that fastens the whole firmly to the table. The bandage is fixed to the axle, A, being threaded beneath the bar, B. By holding the bandage "taut" against the bar with the left hand, D, as the right hand, C, turns the crank to the axle, all wrinkles will be smoothed out from the bandage as it is rolled up. This makes a very handy and useful addition to the apparatus of the surgeon's office.

How to Apply a Roller.—To be applied easily it must be wound evenly and tightly. Hippocrates said, "the turns of a bandage should be made from right to left, and left to right, except on the head, where they should be in a straight or vertical direction." I would simplify this by allowing the surgeon to suit his own convenience, remembering only to place the *external surface* of the initial end to the part to be bandaged. This done, press it firmly with the fingers of the left hand to the member; the right hand grasps the roller-head tightly between the thumb and first and second fingers, and carries it firmly down and around the member (letting it slowly unwind) as far as possible; then, grasping it with the left hand, the thumb of the right confining the initial end, complete the turn, overlapping the initial end completely or partially, as you see in turns 1 and 2 in Fig. 11. Make, then, one or two circular turns as 3 and 4, firmly and evenly sweeping around the limb, each overlapping the preceding course about one-third the width of the bandage. The "*reverses*," which should always be made whenever the part to be bandaged assumes anything of a pyramidal or conoidal contour, as they keep the bandage from slipping down, are formed by pressing the first and second fingers firmly upon the superior border of the bandage at the point where the reverse is to be made, thus securing the bandage; then, making a slack motion

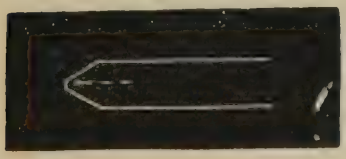
FIG. 11.

of the right hand turn the bandage over, *end for end*, by the right hand fingers, and bring what was the *superior* border of the bandage down to the top of the left hand's finger, or fingers that are confining the bandage; you thus make an *inferior* of what was the superior border. Each succeeding reverse is to be made in the same way. There is also a "catch" to this, although simple as it may seem, that only repeated trials will enable you to become master of. The main points, however, to bear in mind, are: 1st. Keep the bandage always tight and with equal tension at every turn. 2d. Bring it up somewhat diagonally, before making the reverse, and carry it down diagonally (the opposite of the other) after the reverse is made, as you see in the figure. 3d. Always have the edges of the overlapping turn as nearly equal all around as possible; this is best done by keeping a "close eye" upon the upward and downward motions of the roller-head, and after a time this will be done unconsciously. The first few applications of a reversed roller should always be slowly and pains-takingly made, so that your hands may not learn some bad tricks that must be unlearned them before they will apply one smoothly and nicely. *Festina lente* is a good motto in bandaging.

How to Confine a Roller.—To confine a roller properly is a nice point in the application of such a surgical dressing, although it is a manœuvre that is too often clumsily and imperfectly made.

On reaching the terminal end of your bandage, always fold under the edges of the end, so as to bring it to the shape seen in Fig. 12. Then introduce your pin (*not* perpendicularly but) in a direction contrary to the course of the bandage, as you see in the wood-cut. By so doing you will have it smoothly and *securely* confined. If the roller be very wide, two pins may be necessary. The "strain" on the bandage thus serves only to draw the pin into its place, and no ordinary amount of friction from the bed-clothes or wearing apparel will loosen it.

Fig. 12.



CHAPTER V.

CLASSIFICATION OF BANDAGES.

In olden times bandages received their names from four sources, viz., 1st. Their authors. 2d. Their forms. 3d. Their uses. 4th. From some fancied resemblance to some article, or manœuvre.

Thus we have the Hippocratic *rhomb;* the *crooked nose;* the *hare;* the *quadriga,* etc., as epidetic terms frequently to be met with on persual of old authors. Nothing like a classification proper was attempted by them. Coming nearer to our own time, an attempt was made to put them all under the heads of their uses; such as "compressive," "retentive," "reductive," etc. But this utterly failed, as almost any bandage could be used for any of the special purposes for which the others were employed. Gerdy finally brought forward his system, that of referring all to some general figure, as "cross," "circular," "spiral," "figure of 8," etc., adding, as a generic cognomen, the part to which it was applied; as, "cross of the eye"; "cross of the head"; "spiral of the finger"; "figure of eight of the chest," etc. Mayor then produced his system of triangular and quadrilateral bandaging, naming them from the anatomical parts to which they were applied; a double name, in fact, the first being the part whereat the base of his triangle was applied, the other around or over which the ends were passed and fastened, *e. g.;* "occipito-frontal" would indicate that the base of his triangle was at the occiput, and the two ends of the triangle had been passed around and tied at the forehead. This latter system of nomenclature is really the more scientific; but it is hardly convenient to adapt it to our roller bandaging, the system most universally employed. The system of triangles and quadrilaterals of Mayor, though very convenient, will hardly come into general use, as it is impossible to get so

smooth and nicely adjusted a triangle as a roller. In some cases, as for instance that of an exigency, it is well to understand his system; as by that you can adapt almost anything to the purpose until a better dressing can be procured.

All bandages are divisible into two great classes, the *simple* and the *compound.* Under each of these are found many varieties, the prominent ones of which will be given under their respective heads.

A Simple Bandage is understood to be of a single strip of flannel, or cotton, and may have one or two heads; may or may not be invaginated. In Mayor's system, a single triangle or quadrilateral, invaginated or not, comes under this division.

A Compound Bandage can be briefly defined as a bandage made up of two or more pieces of flannel or cotton, whether in strips (rollers), triangles, cravats, or quadrilaterals; and may be invaginated, stitched (as a T), or modified in any way that the surgeon may see fit.

Besides these two general classes we have a *regional* classification; merely, however, for descriptive convenience, as the execution of a bandage is essentially the same in all parts of the body. These divisions are, 1st. Bandages of the Head. 2d. Bandages of the Neck. 3d. Bandages of the Upper Extremity. 4th. Bandages of the Trunk. 5th. Bandages of the Lower Extremity.

This general plan of description I shall follow, giving first the roller bandages, belonging to the simple order, following each one with Mayor's that fulfill the same office; and lastly give those of the compound order, Mayor's triangles and cravats following those of Gerdy's system (the roller bandages), as before.

CHAPTER VI.

BANDAGES OF THE HEAD.

SKULL-CAP.

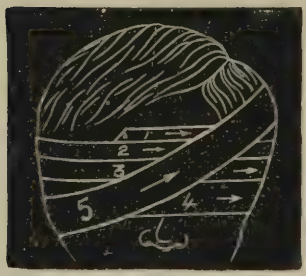
In all of the bandages of the head it is well to first apply a close-fitting flannel or cotton cap, known as a skull cap, to the head. It retains the bandage better in position, as it keeps the turns from coming in contact with the slippery and sliding hair. It will also be found full as comfortable to the patient, as it tends to keep the hair evenly distributed about the head, and so prevents its matting under different portions of the bandage. Pressure from the bandage is also more equalized.

CIRCULAR OF THE FOREHEAD AND EYES.

Description.—It should be three or four yards in length, and have a width of from one and one-half to two inches.

Application.—Place the initial end 1 at or near the centre of the forehead, standing at the back of the patient, and confine by a horizontal circular turn, 2. At the 3d turn begin to drop the course of the bandage still more, so that on its completion it shall have been dropped one-half or three-quarters of its width. The 4th turn is to be made in a similar manner, covering the eyes and as much of the face as seems necessary; then, after an upward spiral course, 5, confine the bandage by a pin or thread, at or near its starting point.

FIG. 13.



Circular of the Forehead and Eyes.

Uses.—This bandage, though necessarily so simple, fulfills many important indications. In wounds of the forehead or upper part of the face, and operations thereon, in injuries and operations on the eyes and nose, and nasal passages, it serves

to convey proper soothing applications to the parts, as well as to restrain excessive muscular action, and so facilitates union between the edges of the wound.

THE FILLET, OR HEAD-BAND.

Description.—A piece of flannel, or cotton, thirty inches long by twelve inches wide. At a half an inch from the inferior border, midway from the two ends of the bandage, cut out a triangular piece (the base downwards) so as to leave an opening sufficiently large to admit the nose.

Application.—Standing behind your patient, place the centre of the bandage over the face, covering it from the mouth up; the nose being permitted to pass through the triangular opening. Carry each end horizontally backwards about the head, and confine with pins or stitches.

FIG. 14.

The Fillet, or Head-band.

Uses.—This bandage admirably takes the place of the preceding in retaining dressings to the parts about the upper portion of the face. It can be used (though it is less elegant) in the place of the Monocle or Binocle, soon to be described.

A '*Sling*' and a "*Triangle*" of the face have been devised, but they are really not so convenient as the Fillet. The former is a four-tailed bandage (made similarly as the Sling Compress, Fig. 4, page 22). The body of the bandage is placed over the face, and the extremities are carried backwards and fastened, the two superior at the nape of the neck; the two inferior above the occiput; or, they may be crossed at these points and brought forward, and finally confined in front. The *Facial Triangle* is applied in a similar manner. It should be, the base of the triangle, one yard in length; the height, that is from the base to the apex, should be eighteen inches.

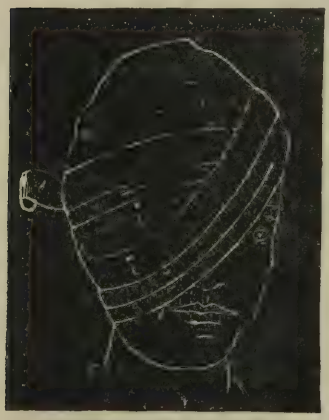
CROSS OF THE EYE.

(*Monocle.*)

Description.—This bandage should be six yards in length and have a width of from one and a half to two inches.

Application.—Taking the right eye, for example, standing behind your patient, place the initial end of the roller, 1, above the right eye, previously protected by a compress or some cotton-wool. Confine this by one horizontal circular turn, 2, about the head, and continue till you come to the occiput, for the next turn; here you make a pass downwards, coming along under the right ear, then up over the inferior angle of the inferior maxilla of the right side, and across the inner angle of the orbit, finishing the third course of the bandage. Continuing from this point (the forehead), the bandage is to be carried up over the left parietal protuberance, then down to a level with the circular turns 1 and 2, and finally finished as a circular of the head, thus making the fourth course. Course 5 is to be executed the same as course 3, remembering to overlap in its course, to the distance of one-half or three-quarters of its width, the preceding turn. Course 6 is executed the same as course 4, remembering the overlapping. Finally, when you come near the terminal end of your bandage, confine by one or two circular courses about the forehead and occiput, following course 2.

FIG. 15.



Cross of the Eye.

Uses.—This is a very pretty and firm monocular bandage, when evenly applied; yet it is one that needs some watching lest some of the courses overslip each other, especially if put on a patient that is not very quiet. A light compress of cotton-wool should fill up the orbital cavity, this will not only

keep the lids securely closed, but it will steady the eye-ball in its socket, as well as produce slight compression.

In the case of the left eye, the proceeding is the same, reversing only the direction of the courses.

For *The Triangle of the Eye*, see "Uses" under the bandage Fronto-oculo-occipital Triangle, page 36.

CROSS OF THE EYES.

(*Binocle.*)

Description.—This bandage should be eight yards in length, and have a width from one and a half to two inches.

Application.—Standing behind your patient, place the initial end of the bandage, 1, over his right eyebrow, and confine there by a horizontal circular turn about the head, 2. On the third turn, when coming to the occiput, pass the bandage down, so as to come around under the right ear, up over the inferior angle of the lower maxilla, and up over the inner angle of the orbit of the right side, thus finishing the third course of the bandage. From this point carry the bandage up over the left parietal eminence, then down to the occiput, and finally horizontally about the head, thus finishing course 4. Continue the course of the bandage horizontally about the head until you come to the occipital region, when you mount up over the right parietal eminence, and pass downwards over the inner canthus of the left eye, thus finishing the fifth course of the bandage. Continue the bandage down across the left cheek and maxilla, and back under the left ear to the occiput, where you mount up to the level of courses 1 and 2, when you finish course 6 as a horizontal turn about the head.

FIG. 16.

Cross of the Eyes.

Turns 7, 8 and 9 are done the same as Nos. 3, 4 and 5, respectively; remembering always to draw in the bandage by

overlapping its underlying fellow by one-fourth, or one-third its width.

On the completion of its application to the eyes, confine by a single horizontal turn about the forehead and occiput, fastening with a pin.

Uses.—This bandage fulfils the same indications for both eyes that the preceding does for the one eye. The "double-headed" roller, for the same purpose, I have omitted, as it is not so firm a bandage, and is more complicated. The ears and parietal protuberances are the main points of support to these ocular bandages; hence, pay particular attention to the "laying of the bandage" about these parts.

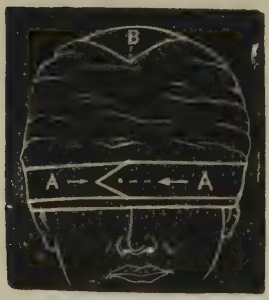
FRONTO-OCULO-OCCIPITAL TRIANGLE.

(Head-band of Mayor's System.)

Description.—Take a piece of cotton cloth large enough so that, when folded to a triangle, the base of the triangle will measure one yard, while its height (from apex to centre of base) will be from fifteen to twenty inches.

Application.—Standing behind the patient, place the base of the triangle over the eyes, having the apex over the head, pointing to the occiput. Carry both ends of the base horizontally around to the occiput, covering over the apex of the bandage, and cross there, bring them forwards and confine at the forehead, A, A, either by pinning or tying. Lastly, carry the apex from the occiput up over the horizontal courses of the two extremities to the region of the forehead, and confine with a pin, as at B.

FIG. 17.



Fronto-Oculo-Occipital Triangle.

Uses.—This is a very simple bandage, as indeed all of Mayor's are, and will nicely take the place of the preceding Cross of the Eyes, or Binocle. It can be easily tilted to one side, covering in only one eye, so as to fulfil the condition of the monocular cross, plated on page 34. It is not so firm, or

evenly compressing a bandage, as the two preceding, and hence would not be so applicable after an operation for cataract, or an iridectomy. Of course, cotton-wool, or some light dressing, will need to be applied to the ocular fossæ before the application of this triangle, just as in the Crosses of the Eyes.

FRONTO-OCCIPITAL TRIANGLE.

(Triangular Bonnet of the Head.)

Description.—This bandage should measure one yard, or more, from end to end, across the base, and should have a height of fifteen or twenty inches.

Application.—Standing behind the patient, place the base of the triangle, 1, at the forehead, over the eyes, having the apex at the occiput. Carry the two extremities horizontally backwards to the occiput, covering in the apex, cross them there, and then bring them forwards and confine at the forehead, 2. Finally, bring the apex forwards, and confine as at B.

Fig. 18.

Fronto-occipital Triangle.

Modifications.—I. By reversing the application of this bandage, putting the base at the occiput and the apex at the forehead, you get the *Occipito-frontal Triangle* of Mayor.

II. By placing the base at one of the sides of the head, the apex covering the other, you get Mayor's *Biparietal Triangle.*

Uses.—The uses of these triangles are very numerous, as they are applicable for maintaining any dressing to almost any part of the head. In so doing they take the place, in great measure, of the Recurrent of the Head, and the Six-Tailed Bandage of the Head, to be described further on.

SIMPLE CROSS OF THE CHIN.

(Roller Bandage of the Chin.)

Description.—This bandage should be about nine yards in length, and have a width of one and one-half inches.

Application.—Standing at your patient's back, place the initial end of the bandage, 1. over the left eyebrow, and confine by one single, horizontal, circular turn, 2, bringing the bandage down under the right ear, continuing it under the lower maxilla and up over the left maxillary ramus, and ear, finishing turn 3. Make, for turns 4 and 5, two vertical circular passes in the course of turn 3, gradually working towards the symphysis of the lower jaw, by overlapping each preceding turn one-half or one-fourth the width of the bandage. After turn 5 has been brought to the right inferior angle of the lower jaw, make a single horizontal circle of the neck, 6. At the back part of the neck mount up the occiput, so as to make the fronto-occipital horizontal turn 7. Then continue to the occiput, down below the right ear, across the symphysis of the chin, making turn 8. Circle the chin again, horizontally (course 9), then mount to the top of the head, passing under the lower jaw, forming turn 10, which is still anterior to turn 5. Turn 11 is made in the course of turn 10, overlapping it in its course. Bring the bandage down under the lower jaw again, thence circle the neck horizontally, forming turn 12. Finally, mount to the forehead, from the occipital region, and confine your bandage by a horizontal circular course, as 13.

Fig 19

Simple Cross of the Chin.

Uses.—In cases of fractures or dislocation of the lower jaw. It is also of use in confining any topical application to the chin, to the parotid regions, and to the ears.

Care should be had that too much constriction is not put upon the neck in making turns 6 and 12, thereby hindering respiration and circulation. If a flannel roller is used no allowance need be made for the swelling of the parts, as the bandage will generally give enough, if it is only "comfortably" (to the patient) applied at first.

FOUR-TAILED BANDAGE OF THE CHIN.

(*Sling of the Chin.*)

Description.—This bandage should be one and one-fourth yards in length, and have a width of about five inches. It should be torn, at the middle of each end, towards the centre (as you see in Fig. 4, page 22), to within two and one-half inches of this point.

Fig. 20.

Sling of the Chin.

Application.—Standing at the back of your patient, place the centre of the plane of the bandage, 1, at the chin; then carry the two *superior* ends of your bandage backwards, below the ears, to the nape of the neck; crossing them here, bring them upwards, and forwards over the parietal protuberances, and confine at the forehead, 2. Take, now, the two *inferior* ends of the bandage, carry them backwards and obliquely upwards across the temporo-maxillary articulations, and confine at the superior posterior angles of the parietal bones, 3.

Uses.—This is quite a firm and solid bandage, and very easy of application. It does not, however, give that full support to the parts that the preceding does, yet it is very applicable when the mobility of the parts is not over-increased by a very oblique or double fracture, or by extensive luxations of the inferior maxilla. For the maintaining of dressings to the chin, parotid region, and the ear, it is, from its simplicity, much to be preferred to the Simple Cross of the Chin.

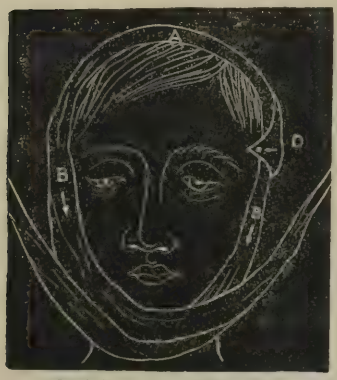
OCCIPITO-MENTAL TRIANGLE.

(*Mayor's Triangle of the Chin.*)

Description.—Have your triangle with a base full one and one-half yards in length, and with a height of twenty inches, or more.

Application.—Standing behind your patient, place the base of the triangle, A, the apex looking backwards, at the top of the head; seize the two ends of the triangle and bring one down below, and the other over and in front of the chin, crossing them this way, B, B, and then carry them obliquely backwards and upwards, across the temporal and mastoid regions, to confine them at the summit of the occiput. Confine the apex as at D.

Fig. 21.



Occipito-Mental Triangle.

Uses.—This bandage was designed by Mayor to take the place of the two preceding bandages. This it does, in a measure, in its ready applicability for the confinement of dressings about the regions it covers. It is easily extemporized, and hence is a "popular" way for maintaining topical applications to these parts.

All of the more modern appliances for the treatment of fractures of the inferior maxilla are but modifications of the three bandages just given. A paste-board, or felt splint, with these bandages, will probably fulfil any of the indications that the more elaborate appliances are designed to, and are full as comfortable to your patient.

CROSS OF THE HEAD.

(*Temple Bandage.*)

Description.—This bandage should be two inches in width by six or seven yards in length.

Application.—Standing behind your patient, place the initial end of the bandage, 1, over the right eye, and confine it by a circular turn, 2, about the head. Continue on for a third course until you come to the right ear; here confine the

bandage, either by stitches, or a pin, inserted perpendicularly with the roller-head, to the posterior angle of the inferior maxilla, covering over the right ear; then, passing under the lower jaw, continue the bandage up over the left ear to the top of the head; then descend to the horizontal courses of the bandage, thus completing course 4. Turns 5, 6, 7 and 8 are to follow in the course of turn 4, viz., perpendicularly around the head, remembering to bring the bandage gradually forwards, by overlapping each preceding turn the quarter, or half, the width of the bandage. Turn 8 being brought to the level of the horizontal turn 2, upon the right side, it is to be fastened with stitches, or a pin, perpendicularly to the course of turns 6, 7 and 8, the remaining bandage being exhausted by horizontal turns about the head and occiput, in the course of turns 1 and 2.

Fig. 22

Cross of the Head.

In this application of the Cross of the Head, it has been supposed that it was the right ear, temple, or parotid region that was diseased or injured. In case of the left, you have but to reverse the application of the bandage; that is, make your turns from left to right, across the forehead, putting the initial end over the left eye.

Uses.—For the protection or application of dressings to the ears, temples, parotid or hyoid regions. Is readily applied and makes a firm dressing.

KNOTTED BANDAGE OF THE HEAD.

Description.—This bandage should be one and a half inches in width, eight or ten yards in length, and rolled into two heads.

Application.—Place the plane of the bandage over the injured temple (the left, for example), and then carry the two heads horizontally about the head to the right parietal region, where you cross one over the other; continue them till you come to the starting point, thus finishing course 2. Crossing them here at right angles (that is, upon the diseased temple), carry one head of the bandage perpendicularly over the head, while you carry the other perpendicularly downwards under the chin, 3, 3, continuing the course of each around the head and chin, until they meet at the diseased temple again, thus finishing the third course. Cross them at right angles again at this point, continue horizontally about the head, as in course 1, until you come to the diseased temple again, thus finishing turn 4. Turn 5 is formed the same as was turn 3, and turn 6 as turn 4, etc., etc.; at last confine the ends of the bandage in the ordinary way.

Fig. 23.

Knotted Bandage of the Head.

Uses.—This bandage is intended to exercise pressure upon the temporal artery, as in case of wounds, accidental or otherwise. It needs to be applied with care, and to be watched, as it is possible to make the compression too severe for a long-continued application of the bandage. It should always be aided by a Graduated Pyramidal Compress (see page 21).

THE T OF THE HEAD AND EAR.

(*T of the Temple.*)

Description.—Take first a bandage from two to four inches wide (according to the extent of the injury to the side of the head) and one yard in length; at right angles to this bandage, at a distance of ten or twelve inches from one end, there should be stitched another bandage, two inches wide and two and a half yards in length, leaving one of its ends projecting some

sixteen or eighteen inches beyond the first or widest portion.

Application.—Place the point of juncture of the two bandages, A, over the right temporal region, if this be the one involved, in such a manner that the widest portion of the bandage, B, shall be perpendicular, as regards the head; then carry the long end of this wide portion of the bandage, B, down under the chin, and up on the other side to the top of the head, there tying or pinning it to the short end, brought perpendicularly upwards from the diseased temporal region. The longer and narrower portion of the bandage, A, is now to be carried horizontally about the head, the long end confining the short one by successive horizontal courses, till it is exhausted, when confine in the usual manner.

Fig. 24.

The T of the Head and Ear.

Uses.—For confining dressings to the temporal, parotid and hyoid regions.

PERFORATED T OF THE HEAD AND EAR.

Description.—The first piece should be three yards long by two inches wide, and to this, perpendicular to its plane, there should be stitched, at eighteen inches from one of its ends, a bandage having the same length and width, save at the extremity attached to the first piece; here it should be semi-oval, with a width two or three times that of the plane of the bandage; this oval part should be perforated by a longitudinal slit of sufficient size to "take in" the ear.

Application.—Pass the ear of the diseased side (suppose it to be the right) through the second portion of the bandage, B, bringing the bandage closely and snugly up to the head.

Carry the shorter end of the horizontal portion of the bandage smoothly around the occiput and forehead, and confine by a single horizontal circular turn, 2. Carry, now, the perpendicular portion of the bandage, B, down under the chin, up over the opposite ear to the top of the head, and down to the starting point, thus finishing the first turn of the perpendicular portion of the bandage. Exhaust the remaining portion of the bandage, B′, by similar perpendicular turns about the head, and, at last confine the end, by a pin, to the horizontal turn 2. This done, exhaust the remaining portion of the roller, A, by horizontal turns about the head, confining as usual.

FIG. 25

Perforated T of the Head and Ear.

Uses.—This bandage is found very useful in maintaining blisters to the mastoid process, or dressings thereto, as is frequently needed in diseases of the ears. It is equally useful in confining dressings upon the ears, or the temporal, parotid, and tonsilar regions.

OCCIPITO-AURICULAR TRIANGLE.

(*Mayor's Cross of the Head.*)

Description.—This should be a triangle having a base of one yard in length, and a height of some eighteen inches.

Application.—This is essentially the same as that of the Occipito-mental Triangle (page 39). The only difference being that this one is crossed *below*, instead of upon, the chin.

Uses.—Essentially the same as many of those for which The Knotted Bandage of the Head (page 41), The T of the Head and Ear (page 42), and The Perforated T of the Head and Ear (page 43) are employed.

RECURRENT BANDAGE OF THE HEAD.

(*Roller Cap of the Head.*)

Description.—This should be one and one-half or two inches in width, and about nine yards in length. It should be rolled into two heads, one being a little larger than the other.

Application.—Standing at the back of your patient, place the plane of the bandage above the eyebrows, carrying each roller head backwards above the ears to the occiput; crossing them there at right angles, carry the inferior portion up over the top of the head, in line of the sagittal suture, 2, to the forehead; this is called the "recurrent" portion.

Fig. 26.

Recurrent Bandage of the Head.

Now, carry horizontally forwards the other roller-head, crossing over the recurrent portion (thus binding it down) at the left frontal region, thus finishing the horizontal turn 2′. Carry, now, the recurrent roller-head up over the horizontal turn 2′ and the right parietal eminence down to the occiput, thus finishing the turn 3. Conduct the other roller-head again horizontally about the head, binding down the course 3 at the occiput, and finish it as turn 3′ at the forehead. Courses 4, 6, 8 and 10 are made similar to course 2, whilst courses 5, 7 and 9 are formed similarly as course 3. The horizontal courses 4′, 5′, 6′ and 7′ are formed similarly as their preceding courses, 2′ and 3′, each binding down some one course of the recurrent portions of the bandage,—the turns 4, 5, 6, 7, 8, 9 and 10, which run from the forehead to the occiput.

Uses.—This is not a very useful bandage, though it looks very nicely when properly applied. The objection to it is, that to give it the proper degree of firmness and security, one has to draw the confining turns of the bandage quite tightly; and this, from the repetition of these courses so directly above

each other, gives to the patient an uncomfortable feeling of tightness and constriction about the head. Besides this, if the wound is very large, it will press upon the bruised portions, and so cause excessive pain, and venous obstruction. In scalp wounds of the top of the head it might be used to good advantage.

SIX-TAILED BANDAGE OF THE HEAD.

(Sling of the Head, Galen's Bandage.)

Description. — This bandage should be forty inches in length, by fifteen in width. Double it, lengthwise, at the middle; then, at a point (upon each side) three inches from the lateral border 1, cut directly toward the folded centre till you come to within three or four inches of it, 2. Then cut obliquely toward the same point, represented by the line 3–2 in the cut, thus removing the triangular pieces 1–2–3 and 3–2–1. The portion 3–3 should be three inches in width.

Fig. 27.

Diagram.

Application.—Place the plane of the bandage upon the top of the head, the ends being at the sides. Bring the central ends A, A′, directly down under the chin, and there confine by tying. Carry, then, the two front ends, B, B′, horizontally backwards, and confine at the occiput. This done, bring the two posterior ends, C, ′C, horizontally forwards, and confine at the forehead.

Fig. 28.

Six-tailed Bandage of the Head.

Uses.—This bandage is applicable for dressing any injury of the top or sides of the head. As it is simple, easily applied, and readily maintains its

position, it may be preferred to the preceding and following. The suggestion that Galen makes (for it is known as his bandage) is a good one. It is to split the two middle ends, so as to allow the passage of the ears in cases where the condition of the patient will warrant such exposure.

TRIANGLE OF THE HEAD.

(*Handkerchief Bandage.*)

Description.—This bandage should be a piece of linen, or a handkerchief, twenty-four to thirty inches square. Fold it to a triangle.

Application.—Standing behind your patient, place the bandage over the top of the head, the triangular portion hanging down over the face. Carry the two ends A, A′, forwards to the forehead, there crossing them so as to carry them back, 2, 2, to the occiput, to be confined by tying or pinning. Then seize the triangular portion that hangs in front of the face, and carry it directly upwards and fold it under the horizontal turns of 2, 2′, as at C.

FIG. 29.

Triangle of the Head.

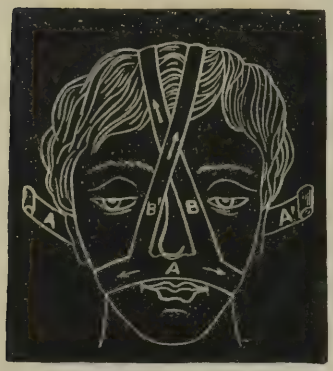
Uses.—As it is easily applied, and the material always at hand, it makes an excellent temporary bandage in cases of wounds or injuries of the upper portion of the head. It is not, however, quite so firm a dressing as the bandage just described.

DOUBLE T OF THE NOSE.

Description.—A strip of flannel two and one-half yards long by one inch wide. At the central portion of this, at a distance of one inch from each other, there are to be stitched, at right angles with the first piece, two other strips, each thirty inches in length by three-quarters of an inch in width.

Application.—Standing behind your patient, place the plane of the main bandage (rolled into two heads) beneath the nose, A, and so that the other two portions, B′, B, may pass up, one upon each side, along the nose. Carry the heads of the main bandage, A, horizontally backwards to the occiput, and cross one head above the other; then take the two perpendicular portions of the bandage, B′, B, up over the top of the head, having them cross each other at the root of the nose, so that the right will pass over the left parietal region, and continue their courses down to the neck, passing one of them beneath the crossed courses of the main part, A; then carry the two roller-heads, A, A′, obliquely upwards across the forehead, and confine with pins, etc., after exhausting both by horizontal turns about the forehead and occiput. This done, tie the ends of the portions B′, B, about the first turn of the roller-heads of the portion A, at the nape of the neck.

Fig. 30.



Double T of the Nose.

Uses.—To maintain dressings to the parts about the nose, as in cases of injury, or after a rhinoplastic operation; or, to hold coäpted the nasal bones, when fractured.

T OF THE MOUTH.

Description.—This bandage should be, the main piece, two yards long and two inches wide. At twenty-four inches from the initial end of this piece there should be stitched (at right angles) to the superior border, a second strip, two feet in length by two inches in width. Cut out a triangular piece, large enough for the passage of the nose, from this second bandage at the place where it is joined to the main roller. Also, from the main roller, at a point below the triangular opening for the nose, cut out a sufficiently large, oval section to accommodate the mouth and lips.

Application.—Standing behind your patient, place the plane of the bandage across the face, so that the oval aperture will correspond to the mouth, and the triangular to the nose; carry the two ends of the main bandage, A, A′, backwards under the ears to the nape of the neck, and cross them, one above the other, there. Then conduct the perpendicular portion of the bandage, B, up between the eyes, over the summit of the head, down to the crossed ends of the part A, A′, and either confine there by pins or stitches; or, after passing under and then over the crossed courses of the main bandage, remount the head and confine at or near the forehead. This done, carry the ends of the main bandage forwards over the ears and exhaust them by horizontal turns about the forehead and occiput, as at A 2, the shorter extremity being first applied.

FIG. 31.

T of the Mouth.

Uses.—For confining dressings about the mouth, jaws, cheeks, or for maintaining the parts in apposition after plastic operations, or other surgical procedures. This, and the preceding bandage, is especially applicable in cases of transverse wounds of the lip at the nasal alæ, or frænum.

INVAGINATED ROLLER OF THE UPPER LIP.

(*Hare-lip Bandage.*)

Description.—I. A two-headed roller, three yards long by three-quarters of an inch wide.

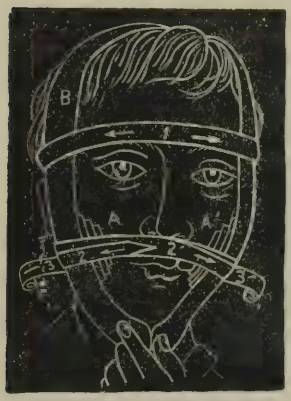
II. A long, narrow compress, say one and one-fourth yards in length by two inches in width.

III. A graduated, pyramidal compress, two inches in length, one and one-half inches in width, and one inch in thickness. The folds of the compress should be stitched through and through, at each end, in order to prevent them slipping.

Application.—Place the graduated compresses A, A′, one upon each side, in the hollow of the cheeks, below the zygoma,

and at about one inch distance from either angle of the mouth, pressing the cheeks and lips well forwards towards the median line. Delivering them to the care of an assistant, take the long compress, B, and place its middle over the summit of the head, allowing the ends to hang down over the sides of the face, and to cover in the graduated compresses, the patient finally holding the ends together under the chin. This done, place the plane of the double-headed roller, 1, upon the forehead, standing behind your patient, and carry the heads backwards and downwards to the nape of the neck, here crossing them to carry them horizontally forwards to the superior lip, 2, 2′, passing one through a slit in the other. Then carry them horizontally backwards to the neck, crossing them again at that point, to carry them forwards to the lip again, passing one through the other as before, thus finishing turn 3, 3′, consigning the heads to an assistant. Take, now, the two ends of the long compress that has been confined temporarily, by the patient, and fold each upwards over the circular turns of the roller, and confine with pins at the temple, or top of the head. This done, take the roller-heads, carry them horizontally backwards (over the folded compress) to the nape of the neck, recrossing them to mount up to the forehead, and exhaust there by horizontal circular turns.

FIG. 32.



Invaginated Roller of the Upper Lip.

Uses.—Useful in all wounds of the lips for keeping the parts coäpted; in operations for cure of "hare-lip" where the tissue seems to be scanty, and the lip-wounds are hard to bring together, it is especially applicable.

Variety.—This bandage can be made equally available for wounds of the lower lip. It is then to be known as the *Invaginated Roller of the Under Lip.* The only difference in the application being that the pyramidal compresses, A, A′, shall

be dropped lower, and that the crosses of the bandage 2, 2′, and 3, 3′, shall take place upon the labium inferius.

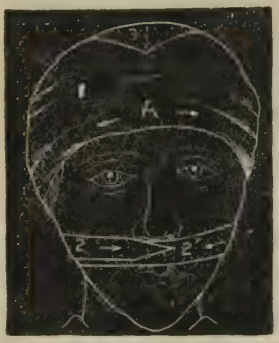
FRONTO-CERVICO-LABIAL TRIANGLE.

(*Mayor's Invaginated Triangle of the Upper Lip.*)

Description.—A square should be folded to a triangle having a base of forty inches, and a height of eighteen inches.

Application.—Place the centre of the base of the triangle upon the forehead, A, carrying the extremities down and backwards to the nape of the neck, covering over the apex of the triangle, there crossing them; then bring them forward over the upper lip, putting one extremity through the slit in the other, as 2, 2′. Carry the ends horizontally backwards to the nape of the neck, there confining them by tying, or otherwise. The apex of the triangle is to be carried directly up over the occiput and pinned at the summit of the head, as at 3. Compresses, similar to those used in the preceding, can be employed to advantage in this bandage of Mayors; and they are especially indicated if much tendency to gaping exists in the wound.

Fig 33.



Fronto-Cervico-Labial Triangle.

Uses.—The same as those of the preceding. As it is more easily applied, and quite as serviceable, it might be recommended, in most cases, to take the place of the Roller Invaginated for the Upper Lip.

Variety.—Instead of crossing the extremities of the triangle upon the upper lip, they can be made to cross upon the *under* one, and thus fulfil the indications of The Roller Invaginated of the Under Lip, described upon page 50. It is then known as *The Invaginated Triangle of the Under Lip.*

POSTERIOR CROSS OF THE HEAD AND NECK.

(*Cross of the Occiput.*)

Description.—This bandage should be five yards in length, and one and one-half inches in width.

Application.—Standing at your patient's back, place the initial end of the bandage near the occiput, as at 1, and confine it by a single horizontal turn, 2; afterwards carry it round to the forehead, in the course of turn 2, till you come to the left parietal protuberance, when you carry it diagonally down to the nape of the neck, making a horizontal circular turn about it for course 4. For course 5, carry the roller head obliquely up across the occiput, over the right ear, then obliquely down to the nape of the neck, from over the left ear, thus finishing course 6. Course 7 is the same as course 5. Course 8, the same as course 6, and so on; at last finish by horizontal turns, about the forehead and occiput, and confine with pins as usual.

Fig. 34.

Posterior Cross of the Head and Neck.

Uses.—In confining rubefacients and vesicants to the nape of the neck; also for retaining dressings, or emollient applications, to burns and other injuries about the occipital region.

FOUR-TAILED BANDAGE OF THE HEAD AND NECK.

(Sling of the Occiput.)

Description.—This should be forty-eight inches in length by five inches in width. Fold it lengthwise, at the centre, and cut back the ends, in the median line, to within three or four inches of the fold.

Application.—Place the plane of the bandage at the nape of the neck; carry the superior ends of the bandage up over the head, and confine there by tying. Then carry the inferior ends horizontally forwards around the neck, and tie; or else cross them, and return to the back of the neck with them, and there pin.

Uses.—Similar to that of the Posterior Cross of the Head and Neck, described above.

CHAPTER VII.

BANDAGES OF THE NECK.

CIRCULAR OF THE NECK.

(*Spiral of the Neck.*)

Description.—This bandage should be one yard in length, and one and a half inches in width.

Application.—Place the initial end of the bandage at one side of the neck, quite low down, and exhaust it by circular turns, gradually working upwards to the jaw, so as to give a spiral form to the courses of the bandage. Confine in the usual way.

Uses.—Is useful in maintaining dressings to the back, sides, or front of the neck. Caution should be observed that it does not constrict the parts, and so impede circulation.

CERVICAL CRAVAT.

Description.—A triangle folded to a cravat of sufficient length to encircle the neck twice.

Application.—Place the middle of the cravat over or near the seat of injury, carry the ends horizontally backward, cross them and bring forwards again, and confine by tying.

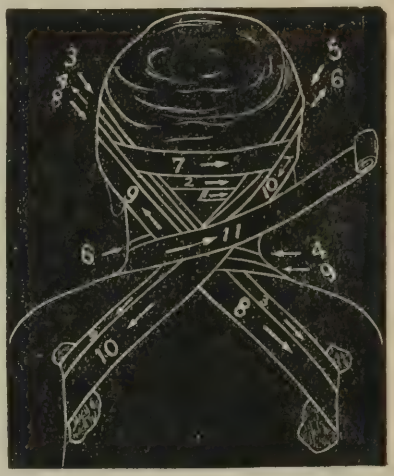
Uses.—Similar to the Circular of the Neck; as it is much simpler, this bandage of Mayor will probably be more often used than the preceding.

POSTERIOR FIGURE OF 8 OF THE HEAD AND THE AXILLÆ.

Description.—This bandage should be nine yards long by one and three-quarter inches wide.

Application.—Standing at the back of your patient, place the initial end of the bandage at the occiput, 1, and confine by a horizontal turn, 2, about the head. Bend, now, the patient's head backwards, and carry the bandage up over the left parietal protuberance, then down across the neck to the right axilla, thus finishing turn 3. Then carry the roller-head under the arm, up over the front of the right shoulder, then to the left parietal protuberance, in line of course 3, thus finishing course 4. Continue the course of the bandage about the forehead, mount the right parietal eminence, and descend diagonally down across the back of the neck, to the left axilla, thus finishing course 5. Pass the bandage under this arm, up over the front of this shoulder, and re-mount to the right side of the head, in line of course 5, thus finishing turn 6. Make, then, a complete horizontal circuit of the head for course 7, coming down over the left parietal eminence to the right axilla for turn 8. Make course 9 similar to course 4, course 10 to course 5, course 11 to course 6, slightly overlapping the preceding turn in each case, and finally exhaust by horizontal turns about the forehead and occiput, there confining as usual.

FIG. 35.



Posterior Figure of 8 of the Head and the Axillæ.

Uses.—In cases of burns of the anterior surface of the neck and the upper part of the chest, where vicious contraction of the cicatrix is to be feared. Also in horizontal wounds of the back of the neck, thus aiding in securing the proper coäptation of the parts. This is quite a firm bandage, and most any degree of backward flexion of the head can be maintained.

NOTE.—Turns 4, 6 and 9 have been exaggerated, at their

crossings upon the back of the neck, in order to show their courses more plainly. In other words, they are too *angular*, as represented in the cut.

DOUBLE POSTERIOR T OF THE HEAD AND THORAX.

Description.—Same as Double Anterior T of the Head and Thorax, page 56.

Application.—The reverse of that bandage, the head being flexed backwards; the application is then essentially the same as seen in cut No. 36.

Uses.—The same as those of the Posterior Figure of 8 of the Head and the Axillæ, and may be preferred to it.

FRONTO-DORSAL TRIANGLE.

Description.—The same as the Occipito-Sternal Triangle described on page 57.

Application.—The reverse of the Occipito-Sternal Triangle. Imagine your patient to be with his back to you, in Fig. 36, and the application will then be readily understood, as it is so similar.

Uses.—Mayor designed this to take the place of the Posterior 8 of the Head and Axillæ, and the Double Posterior T of the Head and Thorax, which it does admirably.

ANTERIOR FIGURE OF 8 OF THE HEAD AND THE AXILLÆ.

Description.—This bandage should be nine yards in length by one and three quarter inches in width.

Application.—This bandage is to be applied just the reverse of that shown in Fig. 35; that is, stand in front of your patient, and place the initial end at the forehead, flexing the head forwards upon the chest.

Uses.—In cases of burns of the back of the neck, or upper portion of the back, where vicious cicatricial contraction is to be feared. Also for transverse wounds of the front part of the neck. This bandage is not often employed, on account of the inconvenience experienced from the crossings of the bandage, which occur upon the patient's face. Either the following, or the Occipito-sternal Triangle, is to be preferred to it.

DOUBLE ANTERIOR T OF THE HEAD AND THORAX

Description.—I. A broad band, eight or ten inches wide, and sufficiently long to encircle the chest.

II. Two shoulder strips to act as "suspenders" of this broad thoracic band.

III. A bandage three yards long and one and three-quarter inches wide. To the superior border of this bandage, at a distance of twenty inches from the initial end, is to be sewed (at right angles) a strip two feet long, by one and one quarter inches wide. To the inferior border (at nearly right angles) are to be sewed two strips, each eighteen inches long by one inch wide, at three inches distant, each way, from the lateral borders of the strip sewed to the superior border of the main bandage; thus having some eight inches intervening between the two inferior strips.

Application. Encircle the thorax with the broad band, A, confining by pins or stitches; and to it pin the "suspenders," B, B'. This done, place the initial end of the roller upon the forehead, C–I, and confine by a horizontal turn, 2; carry the single band, D, up over the top of the head, and down under the horizontal course of the main bandage, at the occiput, again remounting the head and confining with a pin or stitches. After this, exhaust the roller, C, by horizontal courses about the forehead and occiput. After doing this, flex the head upon the chest to that degree deemed requisite,

FIG. 36.

Double Anterior T of the Head and Thorax.

and confine it there by pinning the strips E′, E, to the thoracic band, A.

Uses.—Same as those of the Anterior Figure of 8 of the Head and Axillæ, and is to be preferred to it.

OCCIPITO-STERNAL TRIANGLE.

Description.—I. A triangle one yard long, and having a height of eighteen inches.

II. A triangle of the same size folded to a cravat.

Application.—Place the centre of the cravat at the sternum, and conduct both ends backwards, under the axillæ, and confine with a knot, at the back. Place, now, the centre of the base of the triangle at the forehead, carry the two extremities backwards, over the apex of the triangle, to the occiput, crossing them here to conduct them forwards, and obliquely downwards to the sternum, after having pinned them at the sides of the head. Flex the head sufficiently, and then tie them about the cravat. The apex of the triangle can be confined as in ordinary cases.

Fig. 37.

Occipito-sternal Triangle.

Uses.—Mayor designed this bandage to take the place of the Anterior 8 of the Head and Axillæ, and the Double Anterior T of the Head and Chest, which it does admirably; and for readiness of application, and the abundant security it gives, it is to be preferred to them.

FIGURE OF 8 OF THE HEAD AND AXILLA.

(*Lateral Bandage of the Neck.*)

Description.—This bandage should be six yards long, by one and three-quarter inches wide.

Application.—Standing behind your patient, place the initial end, 1, at the forehead, and confine by a single horizontal turn, 2. Having arrived at the occiput, on the third course, flex the patient's head on the side injured, the right for instance, and carry the bandage down in front of the right shoulder to the axilla, thus finishing turn 3. Continue the course of the bandage beneath the right axilla, and up to the forehead; here reverse and confine with a pin, thus finishing turn 4. Turn 5 is to be in the course of turn 3, turn 6 of turn 4, and so on. At last exhaust the bandage by horizontal turns about the forehead and occiput, or the right arm, as A′, or A.

Fig 38.

Figure of 8 of the Head and Axilla.

Uses.—In cases of burns of the side of the neck where vicious cicatricial contraction is feared; or, of transverse wounds of the sides of the neck, when gaping would otherwise persist.

PARIETO-AXILLARY TRIANGLE AND CRAVAT.

(*Lateral Triangle of the Neck.*)

Description.—I. A triangle having a base one yard in length, with a height of sixteen inches.

II. A triangle of same size folded to a cravat.

Application.—Pass the cravat, A, under the left axilla, supposing you wish to incline the head to the left, and tie in front of the shoulder. Place the base of the triangle, B, over the left parietal region, and carry the two extremities horizontally around the head, cross them, flex the head towards the left shoulder, and bring them down and tie to the cravat. Confine the apex of the triangle with a pin, as usual.

FIG. 39.

Parieto-Axillary Triangle and Cravat.

Uses.—This bandage of Mayor fully takes the place of the preceding, and is far preferable to it, so far as ease of application and removal is concerned. It is equally efficacious in restraining the movements of the head. May be applied to either side of the head.

CHAPTER VIII.

BANDAGES OF THE UPPER EXTREMITY.

SPIRAL OF ONE FINGER.

Description.—This bandage should be one and one-half yards in length by three-quarters of an inch in width.

Application.—Suppose it is the right fore-finger to which you wish to apply the bandage. Pronate the hand; after unrolling four or five inches of the bandage, place it upon the back of the wrist, as 1, and confine it by a single circular turn, 2. Continue the course of the bandage about the wrist till you come to the ulnar border, when you cross down the back of the hand (course 3), and continuing the course of the bandage onwards along the radial side of the forefinger, you encircle this at the tip, as course 4. Courses 5, 6, 7, 8, 9, 10 and 11 encircle the diseased member spirally; while course 12 runs obliquely upwards, from the first finger-cleft, across the back of the hand to the radial side of the wrist, partially encircling it, when you tie both extremities, as at 13.

Fig. 40.

Spiral of one Finger.

Uses.—For maintaining the coäptation of severed parts, when there is a longitudinal wound; also for confining dressings and splints to the part. This bandage is applied to any one of the fingers, or the thumb, of either hand.

POSTERIOR FIGURE OF 8 OF THE THUMB AND WRIST.

(Spica of the Thumb.)

Description.—This bandage should be two yards in length by three-quarters of an inch in width.

Application.—If it be the right you wish to bandage, place the hand midway between pronation and supination. Unroll four or five inches of the bandage, and thus place it, 1, upon the back of the wrist, and confine by two circular turns, 2 and 3; continue in the same course till you come to the ulnar border of the hand, when you descend obliquely across the back of the hand to the radial side of the thumb, at the phalangeal articulation, thus finishing course 4. Pass under the thumb, and then up over it, and diagonally upwards to the radial side of the wrist, finishing course 5. Courses 6, 8, 10, 12 and 14, etc., respectively follow the course of turn 4; while those of 7, 9, 11, 13 and 15, those of course 5. At last exhaust the bandage by circular turns about the wrist, and confine by tying.

FIG. 41.

Posterior Figure of 8 of the Thumb and Wrist.

Uses.—For confining dressings to the back of the thumb, or the first metacarpal space; also as dressing after the reduction of a dislocation of the first phalanx. It can be applied so that the spiral shall run *downwards*, instead of *upwards*, as we have given; but the descending spiral can rarely be put on so evenly and regularly.

POSTERIOR FIGURE OF 8 OF THE HAND AND WRIST.

Description.—This bandage should be one and one-half yards in length by one and one-quarter inches in width.

Application.—Place the initial end, 1, on the back of the wrist—the left, for example,—and confine by a circular turn, 2; continue the course of the bandage about the wrist till you come to the radial border, when you descend obliquely across the back of the hand to the fifth metacarpo-phalangeal articulation, thus finishing turn 3. Turn 4 is a circular course about the metacarpo-phalangeal articulations; while course 5 ascends, obliquely, across the hand, from the radial border of the fore-finger, to the ulnar border of the wrist. Turn 6 is a simple circle of the wrist. Course 7 is in line of course 3, slightly overlapping it; course 8, in line of course 4; course 9, of course 5. Exhaust the bandage, at last, by simple circles about the wrist, and confine in the ordinary way.

FIG. 42.

Posterior Figure of 8 of the Hand and Wrist.

Uses.—For confining dressings to the back of the hand or wrist, as cataplasmata, graduated compresses over ganglionic cysts, etc.; also as an after-dressing after a dislocation backwards of the os magnum, or any of the dislocations backwards of the first row of phalanges.

ANTERIOR FIGURE OF 8 OF THE HAND AND WRIST.

Description.—This bandage should be one and one-half yards long by one and one-quarter inches wide.

Application.—Just the reverse of that seen in figure 42; that is, imagine the palm of the hand presenting, and then apply as above described.

Uses.—To confine dressings to the palm of the hand, and to the anterior surface of the wrist; also to confine compresses to the region of the palmar arches, in case the vessels are wounded, and ligation is called for.

FOUR-TAILED BANDAGE OF THE HAND.

(*Sling of the Hand.*)

Description.—This bandage should be eighteen inches in length by three or four inches in width. Fold the ends together, and then tear, or cut them back to within two inches of the folded centre, thus making a bandage similar to the compress seen in figure 4, page 22.

Application.—Place the plane of the bandage either upon the palm or the back of the hand, according to the seat of injury. Tie the inferior ends about the metacarpo-phalangeal articulations; the superior ends you carry obliquely upwards to the wrist, and confine them there by tying about it.

Uses.—This bandage is intended to take the place of the Posterior and Anterior Figure of 8's of the Hand and Wrist, in injuries about the palm or the back of the hand. As it is more easily applied, it has, perhaps, become a more general favorite.*

DOUBLE T OF THE BACK OF THE HAND AND WRIST.

Description.—The main bandage, A, should be some twenty-eight inches in length by one inch in width. At a distance of three inches from the initial end, stitch, at right angles, another bandage, B, twenty inches long, by three-quarters of an inch wide; at a point two inches from this, stitch, at right angles to the plane of the main bandage, and parallel to B, another bandage, C, of the same dimensions as B.

FIG. 43.

Diagram.

Application.—Place the initial end of the bandage, A, upon the back of the wrist, so that the first perpendicular portion

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* NOTE.—The systems of *Triangles* and *Cravats* are so readily applied to the hand, and are in such common use by the laity, even, no description of them is thought necessary.

of the bandage, B, will correspond to the first interosseous space, and the portion C, with the fourth interosseous space. Confine the initial end by a single circular turn, 2, about the wrist. Carry the portion B down the first interosseous space, around over the palmer surface of the first joint of the index finger, and then back, over the second interosseous space, to the wrist; this done, make another circular turn about the wrist with the main bandage, as turn 3, running over the recurrent portion of B at the wrist. Continue these circular turns of A until the bandage is exhausted, when confine with a pin. Conduct, now, the other perpendicular portion, C, down the fourth interosseous space, across the palmer surface of the metacarpo-phalangeal articulation of the ring-finger, back, over the third interosseous space, to the wrist, here tying with the end or the first portion, B, as at D, after the requisite amount of extension of the palmar tissues, or fingers, has been obtained.

Fig. 44.

Double T of the Back of the Hand and Wrist.

Uses.—In cases of burns of the palm of the hand, or extensive suppurations, where vicious cicatricial contractions are to be feared. In cases of injuries of the finger-clefts, from burns or otherwise; here using compresses, soaked in carbolized oil, to prevent the union of the sides of the fingers from "angular" granulation. Also for confining dressings to the back of the hand.

Variety.—*Single T of the Back of the Hand and Wrist.*—In this case but one perpendicular portion of the bandage is used, as B, or C; it being applied between any finger-clefts desired, and in a manner similar to the above.

The *uses* are similar to the Double T just described, only are more limited.

DOUBLE ANTERIOR T OF THE HAND AND WRIST.

Description.—The same as the Double T of the Back of the Hand and Wrist (page 68).

Application.—The reverse of the Double T of the Back of the Hand and Wrist; that is, it is to be applied to the *front* of the hand.

Uses.—Similar to the above in cases of finger-cleft injuries, or after web-finger operations. Also in cases of burns across the back of the metacarpo-phalangeal articulations, or transverse wounds across the front of the same joints, the point in the use of the dressing being to forcibly *flex* the first row of phalanges as much as possible.

Variety.—*Single Anterior T of the Hand and Wrist.*—Only one perpendicular, or finger-cleft, portion of the bandage is to be used. It can be applied to any of the finger-clefts desired.

The *uses* are similar to the Double Anterior T of the Hand and Wrist, only they are much more limited.

PERFORATED T OF THE HAND AND WRIST.

Description.—A bandage, A, A′, eighteen inches in length by one inch in width. At the middle of this, at right angles to it, stitch a piece of linen, or flannel, B, twelve inches in length by four inches in width, having five perforations; the first, corresponding, from its size and position, with the thumb, as C. The other perforations are made at such a distance from each other, and of such size, as will readily admit the fingers.

FIG. 45.

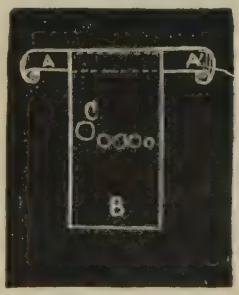


Diagram.

Application.—Suppose it to be the right hand. Carry the fingers and thumb through their respective perforations in the

Fig. 46.

Perforated T of the Hand and Wrist.

portion B, and place the portion A at the back of the wrist. Carry forwards the lower portion of B (see figure 45), up across the palm of the hand, folding it about the wrist, as D, D′. Conduct, now, the two extremities of the main bandage (A, A′, figure 45) circularly about the wrist, binding down the recurrent portion of B (D, D′); and when exhausted, tie the ends together, as at C.

Uses. — Designed to take the place of the Double or Single T Bandage of the Hand and Wrist; also for confining dressings to the palm of the hand, as well as to the dorsal portion.

CARPO-DIGITO-PALMAR TRIANGLE.

Description.—This should be a triangle having a base twenty-four inches in length and a height of twelve inches.

Application.—Place the base of the triangle upon the palmar surface of the wrist; conduct both extremities circularly around the wrist, tying at the back. Fold the sides of the triangle over the dorsum of the hand, and carry the apex of the triangle up over the back of the fingers (extending them as circumstances demand) to the wrist, as at B, there confining.

Fig. 47.

Carpo-Digito-Palmar Triangle.

Uses.—For maintaining dressings to the palm of the hand, and also for extending the fingers upon the forearm, in cases of burns of the palm, where vicious cicatrization is to be feared; also in transverse wounds of the back of the hand. In these latter cases it takes the place of the Double T of the Back of the Hand and Wrist.

CARPO-DIGITO-DORSAL TRIANGLE.

Description.—Same as Carpo-Digito-Palmar Triangle.

Application.—The reverse of that seen in figure 47, in that you place the base of the triangle at the *back* of the wrist, confining as in the preceding case. Afterwards fold the apex up over the palm of the hand, thus flexing the fingers upon the forearm, and confine at the wrist.

Uses.—For maintaining dressings upon the hand, and for maintaining the fingers in a state of flexion, when vicious cicatrization is to be feared upon the back of the hand; also, in cases of transverse wounds of the palm of the hand. It is then designed to take the place of the Double Anterior **T** of the Hand and Wrist.

SPIRAL OF ALL THE FINGERS.

(*Gauntlet.*)

Description.—This should be a bandage ten yards in length by three-quarters of an inch in width.

Application.—Suppose it be the right hand to which it is to be applied. After letting drop four or five inches (enough to tie with) of the initial end, place the bandage upon the back of the wrist, 1, and confine by the circular turns, 2 and 3; afterwards you come obliquely down across the back of the hand, from the radial side, to the little finger, finishing course 4. Continue the bandage outwards to the tip of this finger, making a circular turn, 5, and

FIG. 48.

Spiral of All the Fingers

the spiral turns 6, 7, 8, 9, 10, 11, 12, 13 and 14 about the same member; then conduct the bandage upwards and outwards from the fourth finger-cleft to the palmar surface of the wrist, thus finishing course 15. Course 16 is essentially that of course 4, with this difference: it goes to the ring finger; this finger is spirally bandaged, and the recurrent course, 27, of the bandage is similar to that of course 15. Each of the remaining fingers are similarly wound, and at last both ends of the bandage are tied at the back of the wrist, or forearm, 62.

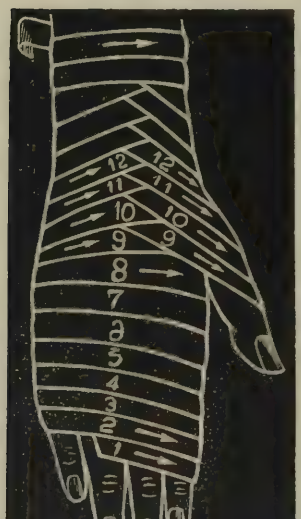
Uses.—In cases of fracture, or dislocation of the phalanges, and burns or other wounds of the fingers and hand, where vicious cicatricial contraction is to be feared, or after an operation for web-finger.

SPIRAL OF THE FINGERS AND THE HAND.

Description. — This bandage should be three yards, or more, in length, and one and one-quarter inches in width.

Application.—Place the initial end of the bandage, 1, at or near the extremities of the fingers, and confine by the spiral turn 2; make six other spiro-circular turns about the fingers, and on the 9th, 10th, 11th, 12th, etc., courses, make the reverse to each turn, so as to accommodate the obliquity of the thumb, and thus prevent the bandage slipping off. At last exhaust by simple circular turns about the wrist, or lower part of the forearm, and confine with the pin, as usual.

FIG. 49.



Spiral of the Fingers and the Hand.

Uses.—In cases of fracture, or dislocation of the phalanges; and also for confining dressings to any part of the hand and wrist. If the fingers should each, separately, demand compression, then the Spiral of All the Fingers (The Gauntlet) should be employed.

THE SHEATH OF THE FINGERS.

Description.—Instead of the more elaborate ones recommended by some authors, you can use the fingers from a large glove; or, if the whole hand is to be enveloped, a mitten.

Uses.—In the simpler injuries about the hand where the more complex bandages are hardly called for.

FIGURE OF 8 EXTENSOR OF THE HAND UPON THE FOREARM.

Description.—This bandage should be six yards in length, by one and a half inches in width, and rolled into two equal heads.

Application.—Place the plane of the roller upon the back of the hand, 1, conduct both heads to the palm, cross them, one above the other, and remount to the back, crossing them there, 2, 2, and conduct them to the palm again. Re-crossing them, carry the heads upwards across the arm, 3, 3, to a point above the olecranon process, the hand being sufficiently extended; make a circle of the arm at this point, 4, 4, crossing the heads before and behind, and at last descend upon the arm again, 5, 5, to make another circuit about the hand, thence to remount to the elbow again. Finally exhaust both heads by circular turns above the elbow, confining as usual.

FIG. 50.

Figure of 8 Extensor of the Hand upon the Forearm.

Uses.—In cases of burns of the palmar surface of the hand, wrist or forearm, where vicious cicatricial contraction is to be feared, and in all other cases, where extension of the hand upon the forearm is desired, as in transverse wounds of the back of the wrist.

FIGURE OF 8 FLEXOR OF THE HAND UPON THE FOREARM.

Description.—This bandage should be six yards in length, by one and a half inches in width, and rolled into two equal heads.

Application.—Similar to the preceding; the plane of the bandage being placed at the palm of the hand, the member being flexed upon the forearm. Courses 1 and 2 are to be made as in the Extensor of the Figure of 8 of the Hand upon the Forearm, and the heads carried above the elbow and the remaining courses made in a similar manner to those of the preceding bandage.

Uses.—In maintaining forward flexion of the hand upon the forearm, as in case of burns of the back of the hand, wrist and forearm, where vicious cicatricial contraction is to be feared. Also in cases of transverse wounds of the forepart of the wrist, where a tendency to gaping occurs.

CARPO-OLECRANON CRAVAT.

Description.—I. Two cravats, each eighteen inches in length.

II. A third cravat, thirty-six inches in length.

Application.—Tie one of the short cravats about the hand, as at A; and then tie the other about the arm, above the olecranon process, as at B. Extend, now, the hand upon the forearm, and confine it by tying the long cravat, C, between, and to, them.

Uses.—The same as the Figure of 8 Extensor. As these cravats are easier applied, and full as safe as the roller bandage, they are to be preferred to it.

Variety.—If need be, a *Flexor* variety of this cravat may be employed. In this case the hand is flexed upon the anterior surface of the forearm, by running the long cravat, c, down the *anterior* surface of the member. This bandage would then take the place of the Figure of 18 Flexor of the Hand upon the Forearm just described.

FIG. 51.

Carpo-Olecranon Cravat.

SIMPLE SPIRAL OF THE FOREARM.

Description.—This bandage should be two yards in length by one and a half inches in width.

Application.—Place the initial end at the wrist and confine by a circular turn above it; exhaust the bandage by encircling the arm with spiraliform turns, as you see in the upper courses of the bandage depicted upon page 68.

Uses.—To retain dressings upon the forearm.

REVERSED SPIRAL OF THE SUPERIOR EXTREMITY.

(*Roller of the Superior Extremity.*)

Description.—This should be twelve yards in length by one and one-half inches in width.

Application.—See figure 11, page 28. This bandage is to be applied as here represented, the courses being continued upwards to the axilla, here confining in the usual way.

Uses.—Most generally employed in cases of fractures, etc., to restrain muscular action, swelling, and to favor the return of venous blood to the vena cava superior. When employed the surgeon should guard himself that he does not allow unequal pressure at any of the courses of the bandage. Should he have one part of the member more tightly constricted than another, he will only increase the mischief already done by the accident by favoring the development of gangrene, from venous stagnation, at the more constricted portions. When evenly and smoothly applied this bandage is of great service to the surgeon; when inaptly applied, a source of great danger to his patient and chagrin to himself. (See note at foot of page 74).

FIG. 52.

Reversed Porous Spiral of the Superior Extremity.

Variety.—When it is specially desired to secure the limb with a bandage that shall not slip, and where steady pressure may be continued for some little time, as in "green stick" fractures, then adhesive bandage, or what is better, the porous adhesive bandage of Grosvenor & Richards could be used, as shown in the cut, in place of the flannel or cotton roller. There would not need to be quite as long a bandage used in these cases, as the overlapping of the courses would be less in extent. The punched holes in the "porous" variety would allow free exit for all discharges, should it be applied over a wounded surface.

ANTERIOR FIGURE OF 8 OF THE ELBOW.

Description.—This bandage should be two and a half yards in length by one and a half inches in width.

Application.—Suppose it to be the right arm to be bandaged. Place the initial end of the bandage, 1, above the bend of the elbow, and confine by a single circular turn, 2. Continue in the same direction till you get to the outside of the arm, when you descend diagonally across the front of the joint, to a point four or five inches below it, thus finishing turn 3. Turn 4 is a circular course about the upper portion of the forearm; turn 5, a spiral turn upwards to the inside of the arm above the bend of the elbow; whilst turn 6 is in course of turn 3; turn 7, of course 5, and so on; at last exhaust by circular turns about the arm, and confine as usual.

Fig. 53.

Anterior Figure of 8 of the Elbow.

A variation can be made, and to good advantage sometimes, by making course 6 to be a circular turn about the arm, as course 2; course 7 then being the same as course 6 in the figure, whilst course 8 is a circle of the forearm, as course 4 in the wood-cut; course 9 would then take the place of course 7 in the cut.

Uses.—Generally to fix a compress over the median-cephalic vein after venesection. Can be employed in cases of wounds in that region, or for maintaining dressings thereto.

Variety.—By making similar courses of the bandage upon the *posterior* surface of the arm and forearm, you get the *Posterior Figure of 8 of the Elbow.*

The *Uses* of this variety are essentially to confine dressings about the back of the joint.

A *Triangle of the Elbow* and also a *Four-tailed Bandage* (Anterior and Posterior) have been devised to take the place of the roller varieties. But these are so readily applied that no further description is necessary.

CERVICO-ULNAR CRAVAT AND TRIANGLE.

Description.—I. A cravat two feet in length.

II. A triangle having a base of two feet, and a height of twelve inches.

Application.—Tie the cravat A, about the neck. Flex the forearm, at right angles upon the arm; then place the base of the triangle at the ulnar border of the hand, the apex, B, being at the elbow, and tie the two extremities of the triangle into the cravat of the neck, as at C.

FIG. 54.

Cervico-Ulnar Cravat and Triangle.

Uses.— In cases of burns at the back part of the elbow, or transverse wounds of the front of the joint; also, as a "sling," in cases of injuries of the forearm, or hand, where elevation, or "rest," of the part may seem demanded. It may be applied over the clothing.

SPIRAL OF THE ARM.

Description.—This bandage should be one and one half yards in length, by one and a half inches in width.

Application.—Essentially the same as that of the Spiral of the Forearm, described upon page 71, except that you begin at the elbow.

Uses.— To confine dressings to the arm-regions, or for the support of the edges of longitudinal wounds, thus securing coaptation. It may or may not be applied with "reverses;" yet, should the biceps be well developed, it would be best to employ them, otherwise the bandage would be in great danger of slipping down.*

* NOTE.--See, for all of these *Spiral* bandages, the description of the *Figure of 8 Spiral of the Extremities* described upon page 107.

FOUR-TAILED BANDAGE OF THE SHOULDER.

Description.—This should be a piece of cloth some forty-eight inches in length, and five or six inches in width. Fold, lengthwise, at the centre, and then cut, or tear, back the extremities to within four or five inches of this point, thus shaping it something like the "sling compress," figure 4, page 22.

Application.—Place the plane of the bandage over the diseased shoulder, and carry the two superior ends of the bandage obliquely down across the chest (one upon its anterior, and the other upon its posterior surface), and tie them below the opposite axilla. Then carry the two inferior extremities of the bandage up around the neck (one in front and the other behind), and confine them by tying.

Uses.—To confine dressings about the shoulders. It furnishes a very handy, though not very firm, variety of dressing.

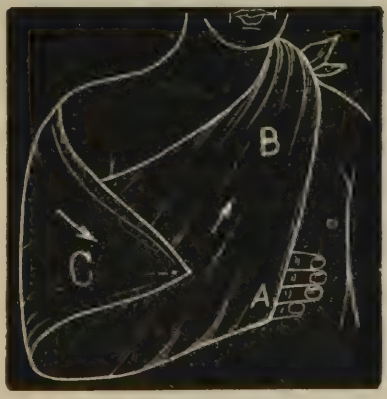
LARGE OBLIQUE TRIANGLE OF THE ARM AND CHEST.

(*Large Triangular "Sling" of the Arm.*)

Description.—A piece of linen, or flannel, folded to the form of a triangle, so that it shall have a base of some sixty inches, and a height of twenty-four.

Application.—Having flexed the forearm to a right angle with the arm, fold it to the breast; place the base of the triangle, A, at the hand, and carry one end backwards under the axilla of the diseased member, to bring forwards, across the back, to the opposite shoulder, there to tie with its fellow, B, that ascends directly upwards, across the front part of the chest, to the same side. The apex of the triangle, C, is then to be brought forward, and pinned as you see in the wood-cut.

FIG. 55.



Large Oblique Triangle of the Arm and the Chest.

Uses.—To support the arm and forearm in cases of injury. The cut represents the bandage as being applied over the naked body; it is applied with equal frequency over the clothing.

TRIANGULAR FRONT OF THE FOREARM.

(*The Ordinary Arm-Sling.*)

Description.—This should be a triangle having a base of forty-eight inches and a height of twenty inches. The laity usually make it from a large shawl, folded to a wide cravat.

Application.—Having flexed the forearm upon the arm, fold it to the chest, and place the middle of the base of the triangle at the hand, A, and conduct the extremities up and around the neck, and confine them by tying. The apex of the triangle can now be folded under the arm to a sufficient extent to have the bandage fit easily, and yet furnish efficient support.

FIG. 56.

Triangular Front of the Forearm.

Uses.—This, in some measure, takes the place of the preceding, yet does not fully supplant it. Is used more as a support of the hand, or lower part of the forearm. This bandage may, or may not, be applied over the naked body.

SMALL FRONT OF THE HAND OR FOREARM.

(*Small Sling of the Hand or Forearm.*)

Description.—A rectangular piece of cloth eighteen inches long by nine inches wide.

Application.—Flex first the forearm at right angles to the arm, and fold to the chest. Place the middle of the bandage beneath the hand, and forearm, carrying both ends upwards and pinning them to the clothing on the breast, as shown in the cut.

Uses.—As a support of the hand, or forearm, in cases of minor injuries.

FIG. 57.

Small Front of the Hand or Forearm.

POSTERIOR DOUBLE FIGURE OF 8 OF THE ELBOW AND THE OPPOSITE AXILLA.

Description.—This bandage should be a cravat, two yards in length by eight or ten inches in width. It can be made out of a small shawl, if necessary.

Application.—Standing in front of your patient, and holding the bandage with its centre across the palm of the hand, place the centre of the cravat over the elbow, A, of the injured member, both ends hanging down towards the floor. Seize the innermost extremity and carry it, *a*, across the inside of the arm, under the diseased axilla, up in front of the same axilla and over the same shoulder, and then obliquely down across the back, B, to the opposite axilla, where you surround the shoulder with the same extremity of the cravat, at last entrust-

FIG. 58.

Posterior Double Figure of 8 of the Elbow and the Opposite Axilla.

ing it to the care of an assistant. Carry the other extremity of the cravat forwards across the bend of the elbow, and over the other end of the bandage, then backwards, under the diseased axilla, as c, and then finally upwards to the opposite shoulder, there confining by tying, after the arm has been sufficiently extended backwards. You will then need a "sling," for the horizontal support of the forearm and hand, which can be pinned to the cravat as it crosses the shoulder, or about the neck. (See Figs. 55, 56 and 57.)

Uses.—This bandage was designed by Dr. E. M. Moore to take the place of the numerous dressings for fractured clavicle. It dispenses with the "axillary pad," and the more complicated system of Fox and Desault, and seems, from certain anatomical reasons, to be superior to theirs for maintaining a coäptation of the clavicular extremities. It certainly has the argument of simplicity in its favor.

SAYRE'S CLAVICULAR PLASTER SPLINT.

Description.—Two pieces of adhesive plaster, poroused or plain, each two and one-half inches in width, and two yards in length.

FIG. 59.

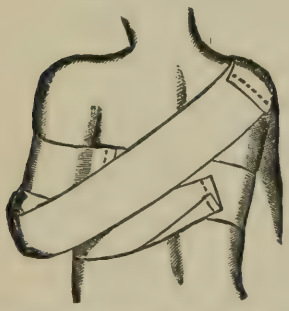
Sayre's Clavicular Splint. 1st Course.

Application.—Pass one strip of the adhesive plaster around the arm at the junction of the middle and lower third, making a loop, leaving an open space at the posterior part of the arm, as you see in Fig. 59; this prevents strangulation; then draw the arm back, bringing the pectoralis major upon the stretch; but the acromial end of the clavicle still rides under the sternal fragment. Now secure the arm back by passing the strip of adhesive plaster around the body, bringing it under the arm of the opposite side, across the thorax, and fasten it to

itself on the back. Care must be taken not to draw the arm too far back, but just sufficient to put the pectoralis major upon the stretch.

Now take the other strip of adhesive plaster, and make a slight longitudinal cut in the centre, to admit the point of the elbow ; flex the arm at an acute angle over the chest, drawing it upward, forward and inward, in this manner reducing the fracture. Bring both fragments of the bone into a perfect line; you now secure the arm in this position by passing the strip of adhesive plaster over the elbow, across the back diagonally to the opposite shoulder, then bring the anterior end of the strip up along the arm and hand over the chest, and fasten it to itself at the shoulder, as shown in Figs. 60 and 61.

FIG. 60.



Sayre's Clavicular Splint, finished.

FIG. 61.

Front view of same.

Uses.—Professor Sayre claims that it is the most simple method of treating fracture of the clavicle that he has ever seen, and is the only plan of treatment which will yield him a perfect result without deformity. He never uses an axillary pad, as the pressure from this often stops the circulation in the arm, and the pain resulting is sometimes terrible.

VELPEAU'S BANDAGE.

Description.—A roller 2½ inches in width, and 8 or 9 yards in length.

Fig. 62.

Velpeau's Bandage.

To make a firmer support, the porous adhesive bandage, as shown in Fig. 62, should be used.

Application.—Have the patient place the hand of the injured side upon the opposite shoulder, as, for instance, the left, as shown in the cut.

Place the initial end of the bandage under the axilla of the *sound* side, then carry the roller-head diagonally up across the back to the top of the injured shoulder; then down across the clavicle, and over the front and outside of the injured arm, and *under* the elbow. From here it is to be carried diagonally up, across the chest, to and beneath the axilla of the sound side, covering in the initial end, thus finishing course 1.

Course 2 is the same as course 1 until you reach the point of the elbow; as soon as this point is reached, you make a horizontal turn about the chest, thus finishing courses 2 and 3.

Course 4 is identical to course 1, whilst courses 5 and 6 are in line with courses 2 and 3, the only difference being to overlap each preceding course one-third to one-fourth the width of the bandage, so as to give the whole a firm support to the parts, and cover in the whole of the arm and chest, as shown in the engraving.

Uses.—This bandage is employed in dressing fractures of the clavicle, fractures of either the coracoid or acromial processes of the scapula, and also in luxations of the humerus.

CHAPTER IX.

BANDAGES OF THE BODY.

SPIRAL OF THE CHEST.

Description.—This bandage should be nine yards in length, by two inches in width.

Application.—Dropping about one yard of the bandage obliquely down across the chest, from the top of one of the shoulders, the left, for instance; carry the head of the bandage down the back to a level with the arm-pits. Make now the spiral turns, 2, 3, 4, 5, 6, 7, 8 and 9, about the chest, and at last confine by pinning, as at 10. Carry, now, the free end of the bandage, 11, which you let fall at the beginning of the application, obliquely up over the chest, to the opposite shoulder from whence dropped, and confine, by pinning, to the posterior spiral turns. The spiral courses may be stitched to course 11.

FIG. 63.

Spiral of the Chest.

Uses.—This bandage is employed where compression about the chest is needed, as in cases of fractures of the ribs, sternum or vertebræ, or separation of the rib-cartilages; also in wounds of the abdomen with presentation of the viscera. It is also of use in emphysema, or after thoracico-paracentesis, thus compressing the walls of the chest, if they be much expanded.

Variety.—If the roller-head should be carried down to the superior margins of the inferior ribs, and then the circular spirals made, we would have the *Spiral of the Abdomen.* Full a yard more of bandage is, in this case, required. It can also be extended down upon the abdomen, from the "Spiral of the Chest," by having the bandage as long again as needed for the performance of the chest spiral. The *uses* of these varieties are similar to those of the above. They are especially applicable where abdominal compression is desired, as after paracentesis abdominis, eviscerating wounds, dropsies, ovarian tumors, etc.

ADHESIVE SPIRAL OF THE CHEST.

FIG. 64.

Adhesive Spiral of the Chest.

As a useful substitute for the flannel "Spiral of the Chest," just described, take an equal sized roller of porous adhesive bandage. It may be applied in a similar manner and will be found to give better *fixed* support to the chest-walls than will the flannel or cotton roller, hence it would be preferred to them in cases of fracture or luxation of the bones or the cartilages of the chest-walls.

It can be applied lower down upon the body, and would then be a variety of the "Spiral of the Abdomen."

CIRCULAR-QUADRILATERAL OF THE CHEST, AND DORSAL CERVICO-STERNAL TRIANGLE.

Description.—I. There should be a quadrilateral wide enough to cover in the thoracic region, and long enough to en-

circle, one or more times, the body, and may or may not be of several thicknesses.

II. A triangle having a base one yard in length, and a height of eighteen inches.

Application.—Encircle the body with the quadrilateral portion of the bandage, as A, and confine by pins or stitches. This done, place the centre of the base of the triangle at the nape of the neck, carry the two ends, B, B, forwards and downwards, across the front of the chest, and confine them with pins to the quadrilateral, or thoracico-encircling portion. Then carry the apex of the triangle down the back, and pin it to the quadrilateral portion of the bandage at the back, so as to prevent it slipping down.

FIG. 65.

Circular-Quadrilateral of the Chest, and Dorsal Cervico-Sternal Triangle.

Uses.—For confining dressings to any portion of the thoracic regions; also for supporting the walls of the chest, in case of injury or disease, where the respiratory movements are to be confined.

Variety.—By widening the quadrilateral portion of the bandage, A, or by dropping it farther down the body, so as to encircle the abdomen, we get the *Circular-Quadrilateral of the Abdomen, and the Dorsal Cervico-Sternal Triangle;* or, if the bandage be wide enough to cover both the thoracic and abdominal regions, the *Circular Quadrilateral of the Abdomen and Thorax, and the Dorsal Cervico-Sternal Triangle.* In either of the cases two strips should be passed from the anterior surface of the quadrilateral to its posterior surface,

across the perinæum, thus preventing the bandage from slipping upwards.

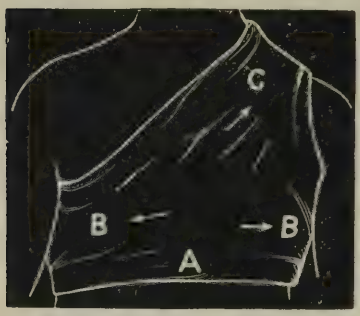
The *uses* of these bandages are to furnish support to the abdomen, as well as the thorax, after ovariotomy, paracentesis abdominis, or other injuries of the abdominal wall.

ANTERIOR THORACICO-SCAPULAR TRIANGLE.

Description.—This bandage should be made of a triangle having a base one and one-quarter yards in length, and a height of eighteen or twenty inches.

Application.—Place the base of a triangle, A, at the inferior and middle portion of the chest. Carry the two ends, B, B, horizontally about the body, and tie at the back. Then carry the apex of the triangle, C, up across the chest, over the shoulder diseased, and then down to the ends tied at the back, where it is to be confined.

FIG. 66.



Anterior Thoracico-Scapular Triangle.

Uses.—To retain dressings upon either of the lateral-anterior surfaces, or the anterior surface, of the chest.

Variety.—By placing the base of the triangle at the back, and then similarly applying, you get the *Posterior Thoracico-Scapular Triangle*, which is useful in confining dressings to either the posterior, or lateral, surfaces of the thorax.

FIGURE OF 8 OF THE NECK AND AXILLA.

(*Spica of the Shoulder.*)

Description.—This bandage should be made from a roller six yards in length by two inches in width.

Application.—Place the initial end of the bandage at the side of the neck, 1; confine by a single horizontal circular turn, 2. Continue the course of the bandage about the neck, at last crossing down to the axilla from over the back of the shoulder, thus finishing course 3. Course 4 is made by carrying the roller-head up over the anterior surface of the shoulder, from under the axilla, to the back of the neck. Course 5 is made the same as course 3; course 6, as course 4; course 7, as course 5; course 8, as course 6, and so on. At last exhaust the bandage by a single horizontal turn about the neck, and confine as usual.

FIG. 67.

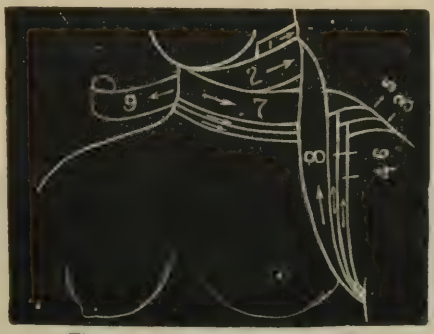


Figure of 8 of the Neck and Axilla.

Uses.—To confine dressings to the clavicular, sub-clavicular, and axillary regions; also, upon the shoulder.

CRAVAT OF THE NECK AND AXILLA.

Description.—A cravat one yard in length.

Application.—Standing at the side of your patient, place the centre of the cravat beneath the diseased axilla. Carry, now, the posterior extremity up over the scapular region, across the top of the shoulder, and around over the front of the neck to the opposite side, thus imitating course 7 of the preceding bandage, only making it in the opposite direction; viz., *upwards.* Then carry the anterior extremity up over the front of the diseased axilla and shoulder to the back of the neck (imitating course 8 of the preceding bandage) to tie with its fellow there.

Uses.—Similar to those for which The Figure of 8 of the Neck and Axilla is employed.

FIGURE OF 8 OF THE SHOULDER AND OPPOSITE AXILLA.

(*Descending Spica of the Shoulder.*)

Description.—This should be made from a roller eight yards in length by two inches in width.

Application.—Place the initial end of the bandage upon the right arm (supposing it to be the *right* shoulder that you wish to cover) and confine it by two horizontal, circular turns, 2 and 3, about the arm. Turn 4 is made by mounting up to the right side of the neck (from the back) and passing diagonally downwards across the chest to the *left* axilla. Passing under this axilla, remount to the right side of the neck (across the back), and then descend to the *right* axilla, thus finishing course 5. Course 6, is similar to that of course 4; course 7, to that of course 5, and so on until the bandage is exhausted, at last confine by pinning.

FIG. 68.

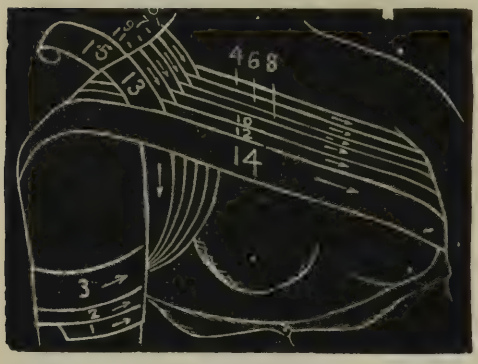


Figure of 8 of the Shoulder and Opposite Axilla.

Uses.—Is used to maintain dressings upon the shoulder, or acromio-clavicular region, arm-pit, or axilla.

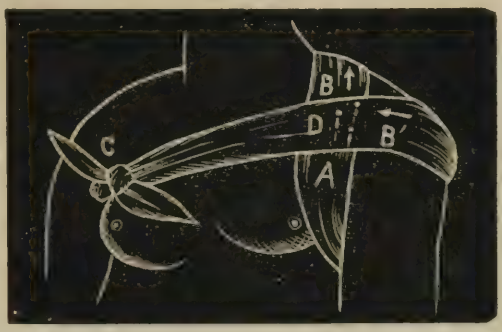
Variety.—The *Ascending Spica of the Shoulder* is applied in a very similar manner, the only difference being that course 4 takes the place of course 14, and course 5 the place of course 13, etc., as shown in the cut; in other words, you ascend gradually upwards to the neck. The descending variety is preferable, as it gives greater solidity.

SIMPLE BI-AXILLARY CRAVAT.

Description.—This should be a cravat (a triangle folded to this form) one yard in length.

Application.—Place the middle of the cravat in front of the axilla of the diseased side, as A; carry both extremities upwards over the same shoulder as B, B′, there crossing them. Then conduct that extremity which passes over the front of the axilla, B, backwards over the shoulder and the back, to the opposite axilla, and tie to the other extremity, B′, that has been passed somewhat obliquely across the breast, as at C. Afterwards pin one to the other at the crossing-point, D.

FIG. 69.



Simple Bi-axillary Cravat.

Uses.—To confine dressings about the axillary region and shoulder; also for bringing the shoulder forwards upon the chest, in cases of wounds at the front of the part, or of burns upon the posterior, or scapular regions where vicious cicatrization may be feared.

COMPOUND BI-AXILLARY CRAVAT.

Description.—This bandage is made from two cravats, each being one yard in length, and made similarly to the Simple Bi-axillary.

FIG. 70.

Compound Bi-axillary Cravat.

Application.—Placing one of the cravats, the centre, beneath one axilla, the right, for instance, conduct the two ends upwards and tie at the shoulder, as A. Place,

now, the other cravat, beneath the opposite axilla, carry one extremity forwards, obliquely upwards, across the chest, and the other obliquely upwards across the back, to the opposite shoulder, passing one end through the noose made by the cravat, A, first applied, and confine by tying, as at B.

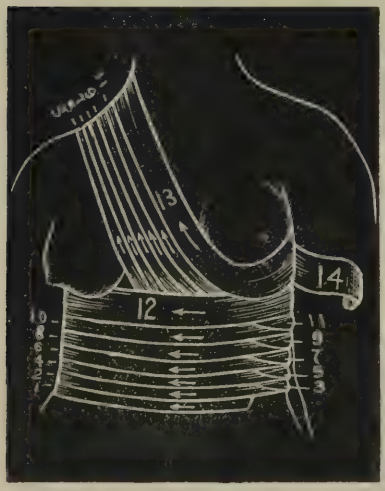
Uses.—Similar to the above. It also affords means for confining dressings to both axillary regions simultaneously.

CROSS OF ONE MAMMA.

Description.—This bandage is made from a roller eight yards in length by two inches in width.

Application.—Place the initial end of the bandage, 1, below the diseased gland, the left for example, and confine by a horizontal circular turn about the body, 2. Continue around the body till you come to a point below the diseased mamma, when you ascend obliquely across the chest to the opposite shoulder (the right in this case), thus finishing course 3. Course 4 is a horizontal circular turn about the body, in line of courses 1 and 2; whilst course 5 is similar to that of course 3. Continue in the same manner till the bandage is exhausted, when you confine it by pinning, as usual.

FIG. 71.



Cross of One Mamma.

Uses.—As a "sling," or support for an inflamed or suppurating breast; and also for exercising a compression upon the gland, when occasion may demand it. In this last case it

should be applied with considerable firmness, so that the direct benefit from continuous pressure may be obtained.

An American surgeon has taken advantage of the expansibility of sponge in maintaining compression of the Mamma. The sponge (a large one) is thoroughly cleansed and impregnated with some antiseptic and then pressed between two flat surfaces until it becomes dry, and as flat as possible. It is then firmly strapped or bound upon the breast with some one of the breast bandages which have been described, and is gradually made to expand, by moistening with water, if the secretions from the gland or sore be not sufficient for this purpose.

FIG. 72.

Porous Adhesive Cross of the Mamma.

Variety.—*The Porous Adhesive Cross of the Mamma.* This is shown as applied to the patient in Fig. 72. The description and application is similar to that of the non-adhesive Cross just described.

NOTE.—This porous adhesive bandage adheres but slightly to the integument; is reversible, hence it is to be preferred to the ordinary Adhesive Plaster Roller. It does adhere, however, to itself, hence furnishes much firmer support than does the flannel or cotton roller. Being perforated, it also adapts itself more evenly to the contour of the gland, and also permits egress for the discharges when crossing over a wounded surface. It was first introduced to the profession by Grosvenor & Richards, manufacturers of Surgical and Medicinal Plasters, Boston, Mass.

TRIANGLE OF THE MAMMA.

Description.—This should be made from a triangle having a base one yard in length and a height of eighteen inches.

Application.—Placing the base of the triangle, A, at the xiphoid cartilage, carry one end obliquely up over the opposite shoulder, B, and the other end, B′, below the axilla of the diseased side, and tie them together at the back. The apex of the triangle, C, is then to be carried upwards over the shoulder of the diseased side, and confined to the extremities of the triangle, at the back.

FIG. 73.

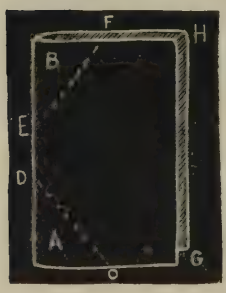
Triangle of the Mamma.

Uses.—Similar to the preceding; but it is more especially adapted than it for retaining cataplasms and other dressings to the gland, and the region about it; is more easily applied than the above, and makes an excellent suspensory bandage for the mamma.

BOURSE OF THE MAMMA.

Description.—A piece of lint ten inches in length, and eight inches in width when folded at the centre. Cut off, then, the folded corners, A and B, by the dotted lines O–D, and E–F; stitch, then, the whole together from G to F; viz., G–O–D–E–F. This done, to each of the two corners at G, and the two at H, stitch a narrow strip sufficiently long to meet and tie, with its fellow (the two inferior), about the body, and (the two superior) about the neck.

FIG. 74.



Application.—Introduce the diseased gland into the bourse A, carry the two ends, B and B′, around the neck, the one on one side, and the other on the other, and confine them by tying ; conduct, now, the two inferior ends, C and C′, horizontally about the chest, and tie them either there, or, after crossing them, bring forwards, and tie in front.

FIG. 75.

Bourse of the Mamma.

Uses.—As a suspensory of the gland in cases of hypertrophy, or extreme flaccidity. Also useful in confining cataplasmata, or other dressings.

CROSS OF THE TWO MAMMÆ.

Description.—This bandage should be made from a roller twelve yards in length by two inches in width.

Application.—Place the initial end midway between the lower extremity of the xiphoid cartilage and the umbilicus, and, going from right to left, confine it by a single horizontal turn, 2. Continue in the same course, till you come to the right side of the chest, when you mount obliquely upwards across the chest, to the left shoulder, thus finishing course 3. Course 4 is a horizontal turn about the chest. Continue about the body, horizontally, till you get to the left scapular region, when you mount obliquely upwards across the back, to the right side of the neck, and then descend obliquely downwards, across the front of the chest, below the left mamma, thus

FIG. 76.

Cross of the Two Mammæ.

finishing course 5. Course 6 is made similarly to course 3; course 7, to course 4 ; course 8, to course 5 ; course 9, to course 6 ; course 10, to course 7 ; course 11, to course 8 ; course 12, to course 9 ; and so on until the roll is exhausted, when you confine as usual.

Uses.—In case of disease of both breasts where suspension is required; also for compression, and for the retaining of dressings. It is not a very stable bandage, besides being open to the objection of somewhat cording the neck. For retaining topical dressings, or for suspension, the triangular mammary bourse, see figure 75, would be preferable.

NOTE.—Mayor's system may be used in making this bimammary bandage by simply applying the Triangular Caps of the Mammæ, one to each gland; the two apices being confined, as described upon page 90, or else tied or pinned together. This would then be known as *The Bimammary Triangle.*

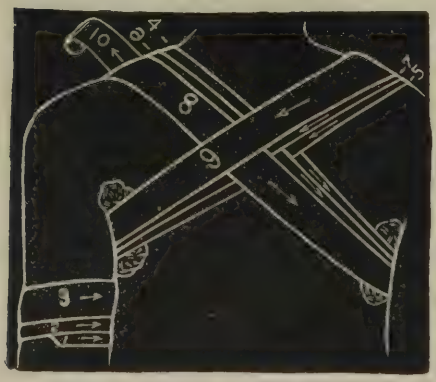
Two Bourses may also be employed; each being made and applied similarly to that one described upon pages 90 and 91.

POSTERIOR FIGURE OF 8 OF THE SHOULDERS.

(The Posterior "Star" Bandage of the Old Authors.)

Description.—This bandage is made from a roller, eight yards in length by two inches in width.

FIG. 77.



Posterior Figure of 8 of the Shoulders.

Application.—Place the initial end, 1, at the middle and posterior part of the left arm. Confine it by two circular turns about the arm, 2 and 3. Continue in the same course till you reach the anterior surface of the arm, when you ascend obliquely across the axilla and

chest to the left side of the neck; from here you descend obliquely across the back, to and beneath the right axilla, thus finishing course 4. Carry the roller under this axilla up to the top of the same shoulder, and obliquely down across the back to the left axilla, thus finishing course 5. Course 6 is made similarly to course 4; course 7, to course 5; course 8, to course 6; course 9, to course 7, and so on until the bandage is exhausted, when you confine as usual.

Uses.—For retaining dressings upon either the anterior or posterior surface of the chest; for fixing the shoulders backward, in case of burns of the chest, or in backward displacement of the sternal end of the clavicle, and also for assisting in holding in coäptation the ends of a broken clavicle, or clavicles. Also of use in luxations of the acromial end of the clavicle. It is necessary to have considerable cotton-wool, or some like substance, in the axillæ, in order to guard against chafing of the parts.

SIMPLE DORSAL BI-AXILLARY CRAVAT.

Description.—This bandage is made from a cravat one and one-half yards in length.

Application.—Place the middle of the cravat across the inter-clavicular space, A. Carry one extremity down below one axilla, the right for example, and up over the same shoulder, B. Carry the other extremity up over the other shoulder, B′, down in front of and beneath the same axilla; at last confine it to the other extremity, after you have sufficiently extended the shoulders backwards.

FIG. 78.

Simple Dorsal Bi-axillary Cravat.

Uses.—This bandage of Mayor takes the place of the preceding, and may be preferred to it for its simplicity.

COMPOUND DORSAL BI-AXILLARY CRAVAT.

Description.—I. A cravat one yard in length.

II. Another cravat two feet in length.

Application.—Tie the shortest cravat about one of the shoulders, the left for example, as at A. Now place the centre of the other cravat in front of the opposite axilla (the right in this case), and carry one end up over the same shoulder (the right) and the other beneath the same axilla, to the back. Carry, now, the superior extremity through the noose formed by the cravat first applied; then twist the other extremity about this one, as at B and C, and finally tie as at D.

FIG. 79.

Compound Dorsal Bi-axillary Cravat.

Uses.—The same as the Simple Dorsal Bi-axillary Cravat, and the Posterior Figure of 8 of the Shoulders. This is a very powerful bandage, and the arm-pits need to be well padded.

Variety.—Take three cravats, two of them being, each, about two feet in length, the remaining one something short of this. Tie one about each shoulder. Then tie the third one through the nooses formed by the first two, so as to bring the two together at the back, thus taking the place of the single noose, B, C, D, of the preceding cut. If there is danger of either of these bandages slipping from the shoulder, a cravat might be tied across the breast, from one to the other, similar to that at the back, thus effectually preventing such a mischance.

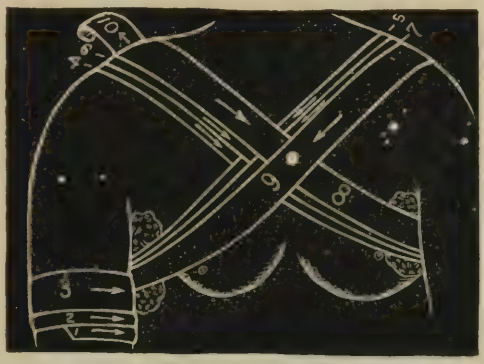
ANTERIOR FIGURE OF 8 OF THE SHOULDERS.

(*Anterior "Star" Bandage.*)

Description.—This bandage should be eight yards in length by two inches in width.

Application.—Place the initial end, 1, at the front of the middle of the right arm, and confine by two horizontal circular turns, 2 and 3. Continue in the same course till you reach the posterior surface of the arm, when you mount up over the shoulder of the same side then cross diagonally downwards to the left axilla, thus finishing course 4. Pass the roller-head beneath this axilla, up over the same shoulder, and diagonally down across the front of the chest to the right axilla, thus finishing course 5. Conduct the bandage under this (the right) axilla, and then upon the right shoulder, and diagonally down across the front of the breast to the left axilla, thus completing course 6. Course 7 is made similarly to course 5; course 8 to course 6; course 9 to course 7, and so on. At last exhaust the bandage, and confine either by pinning or stitching to the other courses.

FIG. 80.



Anterior Figure of 8 of the Shoulders.

Uses.—In cases of fractures of the sternum, or separation of the sternal cartilages; also in cases of burns on the interscapular regions, when vicious cicatrization is to be feared. Might be of use in some clavicular dislocations. As in all of the axillary bandages, this one needs a thorough protection of the axillæ by cotton-wool in order to prevent chafing of the parts, especially the posterior portion.

SIMPLE STERNAL BI-AXILLARY CRAVAT.

Description.—This bandage is made from a cravat one and one-half yards in length.

Application.—The opposite to that of the Dorsal Cravat, described upon page 93, this one being applied across the chest instead of the back.

Uses.—Similar to those for which the preceding is employed.

COMPOUND STERNAL BI-AXILLARY CRAVAT.

Description.—Two cravats, one one yard in length, the other two feet in length.

Application.—Opposite to that of the Compound Dorsal Bi-axillary Cravat, described upon page 94. This one being applied across the chest.

Uses.—Same as the Anterior Figure of 8 of the Shoulders.

Variety.—Prepare three cravats, two of them being two feet in length, the third one not quite so long. After tying one of the longer ones about each shoulder, tie the remaining one into the nooses formed by the other two, across the front of the chest. A fourth cravat is now necessary to prevent those fastened about the shoulders from slipping forward and off these parts, and is to be tied to them across the back

CHAPTER X.

BANDAGES OF THE LOWER EXTREMITY.

SPIRAL OF ONE TOE.

Description.—This should be made from a roller four feet in length by three-quarters of an inch in width.

Application.—This is so similar to that of the Spiral of One Finger, described upon page 60, figure 40, that no further discussion is necessary.

Uses.—For injuries to the toes, similar to those of the fingers for which the spiral is there used.

FIGURE OF 8 OF ONE TOE.

(*Spica of the Toe.*)

Description.—This bandage should be made from a roller, two yards in length by three-quarters of an inch in width.

Application.—Similar to that of the Figure of 8 of the Thumb and Wrist, or Spica of the Thumb. See figure 41, page 61.

Uses.—Of a similar use to that of the Spica of the Thumb.

ADDUCTOR BANDAGE OF THE BIG TOE.

Description.—The bourse may be cut from the "thumb" of a buck-skin or a dog-skin glove. To this, on one side, stitch a piece of elastic ribbon. To this elastic ribbon attach also a strip of ordinary adhesive plaster; one that is long enough to reach around the foot.

II. Two other smaller strips of adhesive plaster of sufficient length to surround the foot, as shown in the cut.

Application.—Supposing it is the pollex of the right foot that is to be treated, the bourse is to be applied over the toe, the member being adducted as much as possible, and the strip, with the adhesive plaster and webbing, is then carried firmly along the inside border of the foot, around back of the heel, down the outside foot-border to the little toe, and there confined. The shorter pieces of adhesive plaster are then placed around the foot, one in front of the ankle, the other over the metatarsal region, thus confining the webbing more securely.

FIG. 81.

Adductor Bandage of the Big Toe.

Uses.—This dressing was devised by Dr. Chas. H. Lathrop, of Lyons, Iowa, for the cure of bunions on the joint of the large toe. It is equally serviceable as a dressing after separation of adhesions of the toe-cleft, or to prevent vicious cicatrices at this point.

DOUBLE T OF THE TOES AND ANKLE.

Description, Application and Uses are so similar to the Double T of the Back of the Hand and Wrist, that a reference to it, figures 43 and 44, pages 63 and 64, will be sufficient for its application to the foot.

SPIRAL OF ALL THE TOES.

(*Gauntlet of the Foot.*)

Description.—This bandage should be ten yards in length by three-quarters of an inch in width.

Application.—Similar to the Gauntlet of the Hand. See figure 48, page 67.

Uses.—Similar to those of the Spiral of All the Fingers just referred to, only in cases of diseases or injuries of the foot.

FIGURE OF 8 OF THE FOOT AND ANKLE.

Description.—This should be a roller two and a half yards in length by one and three-quarters inches in width.

Application.—Place the initial end, 1, at the front of the leg, a few fingers' breadth above the ankle, and confine it by the horizontal circular turn, 2. Continue in the same course till you come to the inner malleolus again, supposing it to be the left foot that you are dressing, when you descend obliquely across the dorsum of the foot, to the fifth metatarsus, thus completing course 3. Make, then, a circular turn about the metatarsal bones (course 4), coming obliquely across the dorsum of the foot, from within outwards, to the outer malleolus, thus completing course 5. Course 6 is made similarly to course 3, course 7 to course 5, and so on. At last exhaust the bandage by circular turns about the lower portion of the leg, and confine in the ordinary way.

FIG. 82.

Figure of 8 of the Foot and Ankle.

Uses.—For confining dressings either to the dorsum of the foot, or to the surface contiguous to the malleoli. Also for compression, after venesection from one of the dorsal veins of the foot; a graduated compress would be necessary in this case.

SPIRAL OF THE FOOT.

This bandage is but a part of the Reversed Spiral of the Inferior Extremity, and will be sufficiently described when we come to treat of that dressing. See page 110.

TRIANGLE OF THE FOOT.

Application.—A triangle with a base two feet in length, and a height of ten inches.

Description.—Place the base of the triangle obliquely across the front of the ankle, A, and carry the superior end, B, around the lower part of the leg, and confine. Conduct the inferior extremity about the metatarso-phalangeal bones and pin, as at c'. Then conduct the apex of the bandage about the heel, and pin as at C.

FIG. 83.

Triangle of the Foot.

Uses.—To confine dressings either to the dorsum or the sole of the foot, to either of the malleoli, or regions adjacent, or to the calcanean region, or the lower part of the leg.

FOUR-TAILED BANDAGE OF THE INSTEP.

(Sling of the Instep.)

Description.—This should be a strip of cloth eighteen inches in length, and four inches, or more, in width, cut to a four-tailed bandage, as seen in the compress of four heads (figure 4).

Application.—Place the centre of the bandage at the instep, and carry the two superior ends around the lower part of the leg and tie them; then carry the two inferior ends around the tarsal portion of the foot, and tie also.

Uses.—To confine cataplasmata, and other dressings, to the instep, lower front portion of the leg, and the tarsus.

FOUR-TAILED BANDAGE OF THE HEEL.

(Sling of the Heel.)

Description.—A strip of cloth eighteen inches in length, and four or more in width, and torn to a four-tailed bandage.

Application.—Place the body of the bandage at the heel and carry the two superior ends around the lower portion of the leg, and confine. The two inferior ends are then to be carried about the tarsus, and also tied.

Uses.—To confine dressings to the calcanean region.

SHEATH OF THE FOOT.

Instead of the more elaborate bandage proposed by some surgeons, an equally efficacious bandage, and certainly easier obtained, is a common "*stocking.*" Is used as a retainer of cataplasmata to the toes or foot.

POSTERIOR FIGURE OF 8 OF THE KNEE.

Description.—The roller should be four yards in length by one and three-quarter inches in width.

Application.—Placing the initial end of the bandage, 1, at a point somewhat above the popliteal space, confine it by a horizontal turn of the bandage, 2. Continue in the same direction, passing over the front of the thigh, till you come nearly to the posterior surface again, where you descend, obliquely, across the popliteal space to the opposite border, thus finishing course 3. Course 4 is a horizontal turn about the upper part of the leg; while course 5 ascends obliquely across the popliteal space to the opposite lateral border. Course 6 is in line of course 3; course 7, of course 5, and so on. Having exhausted the bandage, after covering-in the popliteal space, confine in the ordinary way.

FIG. 84.

Posterior Figure of 8 of the Knee.

Uses—To confine dressings to the popliteal space; or, with the aid of a graduated compress, to exercise compression upon an aneurism at this point.

THE POPLITEAL CRAVAT.

Description.—A cravat some four feet in length.

Application.—Place the centre of the cravat, A, at a point just above the popliteal space, and carry the two ends horizontally forwards about the thigh; cross them, and descend obliquely across the space, B, B′, crossing one above the other there; carry them now horizontally forwards about the upper portion of the leg, crossing them below the patella, to conduct them to the posterior surface of the leg, confining by tying, as at C.

FIG. 85.

The Popliteal Cravat.

Uses.—This bandage fulfils the same indications as the above.

ANTERIOR FIGURE OF 8 OF THE KNEE.

Description.—A roller four yards in length by one and three-quarters inches in width.

Application.—Essentially the same as that of the Posterior Figure of 8 described upon page 101, only remembering that it is to the anterior surface of the limb that you are applying the bandage.

Uses.—To aid in supporting the patella, when fractured; to compress an effusion into the joint, and to confine various dressings thereon.

CRAVAT OF THE KNEE.

Description.—A cravat some four feet in length.

Application.—Place the centre of the cravat, A, see figure 85, page 102, above the patella, and carry the two extremities backwards and cross them, and so bring diagonally down across the front of the patella, in a measure similar to that seen in The Popliteal Cravat just referred to. The other

courses of the bandage are made similarly to the corresponding courses of this popliteal dressing.

Uses.—As an approximator of the fragments of a fractured patella, and for "steadying" the motions of the joint, or confining loose dressings thereon.

TESTUDO OF THE KNEE.

(*Roller Cap of the Knee.*)

Description.—A roller eight feet in length by one and three-quarter inches in width.

Application.—Place the initial end of the bandage, 1, below the patella, and confine by a single circular turn, 2. Continue in the same course with the bandage, making an ascending spiral course for turn 3. The roller-head is now carried upwards across the popliteal space, above the femuric condyles, and made to take the descending spiral course 4, to finish this turn of the bandage. It is then carried downwards across the popliteal space, so as to be in readiness to make the ascending spiral course 5. Course 6 is made similarly to course 4; course 7, to course 5, and so on, gradually "drawing in" the bandage till the patella is entirely covered, when you either confine, or else go on to finish the bandage as a spiral of the thigh.

Fig. 86.

Testudo of the Knee.

Uses.—To confine dressings about the knee-joint, to exercise compression thereon in cases of synovitis, or to steady the joint and prevent motion in cases of other injuries of the leg.

Is frequently made use of in the Spiral of the Inferior Extremity, when covering in the knee-joint.

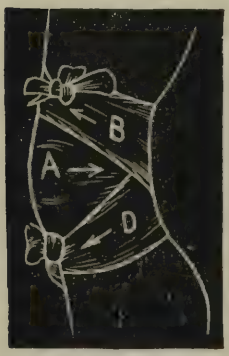
Variety.—Instead of the alternate upward and downward spiral courses being used, a bandage, fulfilling the indications of the above, may be made by the use of continued ascending

spirals about the member. This is the form most generally made use of in applying the Spiral of the Inferior Extremity, and is seen in the figure of that bandage on a following page. It is known as *The Spiral of the Knee.*

FOUR-TAILED BANDAGE OF THE KNEE.

Description.—A strip of linen or cotton, from eight to ten inches in width, and one yard in length. Each end to be torn back (at its centre) to within eight inches of the middle of the bandage.

FIG. 87.



Four-tailed Bandage of the Knee.

Application.—Place the plane of the bandage, A, over the patella, and carry the superior ends of the bandage around the lower part of the thigh, crossing them to remount the member, B, to tie in front. Then conduct the two inferior extremities in a similar manner about the upper portion of the leg, D, to finally confine by tying below the patella.

Uses.—To confine cataplasmata or vesicants upon the patellar region. It can also be made use of to approximate the patellar fragments, when the bone is fractured; or, with the aid of compresses, to exercise compression, in cases of chronic synovitis.

SANBORN'S SPLINT FOR THE PATELLA.

FIG. 88.

Sanborn's Splint for the Patella.—1st Stage.

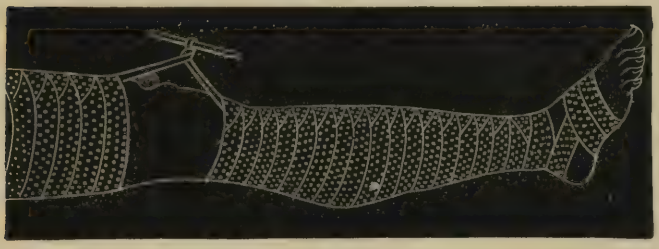
Description.—I. A strip of adhesive plaster three or four feet in length, by three inches in width.

II. A roller bandage, or what makes a preferable dressing, the perforated adhesive bandage, eight feet in length, by two inches in width.

Application.—The strip of plain adhesive plaster is to be first applied to the front of the thigh and leg, as shown in Fig. 88, with a loop over the injured patella.

This strip of plaster is then to be confined to the member, as shown in Fig. 89, which is virtually the "Reversed Spiral of the Inferior Extremity."

Fig. 89.



Sanborn's Splint for the Patella.—2d Stage.

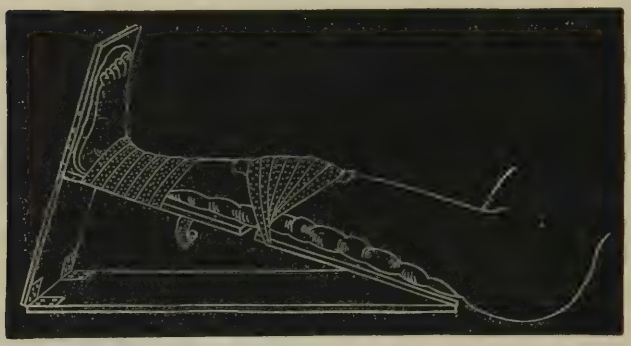
After the plaster strip is thoroughly confined by the bandage, a firm compress, as a small roll of the adhesive bandage itself, is then to be placed above the fractured and separated bone, as shown in Fig. 89; also another beneath the lower edge of the inferior fragment. This done, a stick is to be thrust through the loop left by the adhesive plaster, and this loop twisted by the stick till the separated parts of the bone are brought into apposition, when the whole is to be confined.

Uses.—To support the portions of a fractured patella.

Variety. A slight modification of the apparatus here shown would, with a wire frame about the thigh, form an excellent modification of "Smith's Anterior Splint" for a fractured femur.

HAMILTON'S SPLINT FOR FRACTURED PATELLA.

FIG. 90.



Hamilton's Splint for Fractured Patella.

Fig. 90 shows the adhesive bandage as applied to the lower extremity, to retain the pieces of the patella in position when transversely fractured, according to the method of Prof. Frank H. Hamilton. This variety of bandage will be found to give better support than will the ordinary flannel or cotton roller in this surgical dressing.

The other various forms of fracture dressing—zinc or tin splints, plaster casts, etc.,—can be equally well confined in this manner, altering, of course, the arrangement of the courses of the bandage, or plaster strips, to conform to the various dressings and members the bandage is calculated to support.

SIMPLE SPIRAL OF THE LEG.

Description.—This bandage is made from a roller four yards in length by two inches in width.

Application.—Beginning at the ankle, make a simple circular turn about the member, thus confining the initial end of the bandage. Then continue the turns of the bandage spirally about the member (omitting the reverses) as seen in turns 15, 16 and 17 of the figure accompanying the Spiral of the Inferior Extremity. At last confine as usual.

Uses.—For maintaining pressure upon the parts covered,

or for retaining dressings thereon. Is not a very stable bandage should the musculi gastrocnemius et soleus be well developed.

Variety.—This bandage may be applied to the thigh; it then becomes *The Simple Spiral of the Thigh.* The starting point, in this case, being at the knee.

REVERSED SPIRAL OF THE LEG.

Description.—A roller eight feet in length by two inches in width.

Application.—This is but a part of the bandage described under the head of The Reversed Spiral of the Inferior Extremity, and will be sufficiently described when treating at that bandage. See figure on page 110.

Uses.—This makes a very stable sort of dressing, and is to be employed, in most cases, in preference to the preceding bandage, as it is not so liable to slip down and out of place.

Variety.—This bandage may be equally well applied upon the thigh, starting at the knee. It is then known as *The Reversed Spiral of the Thigh.*

THE FIGURE OF 8 SPIRAL OF THE EXTREMITIES.

Description.—This bandage is a *double* spiral, and needs for its application a roller-bandage ten yards in length by two inches in width.

FIG. 91.

The Figure of 8 Spiral of the Extremities.

Application.—Place the initial end at the roots of the toes, confining by a single spiral turn about the foot, and cover the foot as in the Spiral of the Inferior Extremity, by reverses and figures-of-8. Having reached the leg, one turn and a half is made before a reverse is used. Thus the reverse is employed on the second turn of an ordinary spiral instead of upon the first, as in the simple spiral

with reverses. This process of reversing upon each second turn from the last reversement is pursued up the entire limb. Hence, course 9 is a simple spiral, whilst course 10 is a spiral with a *reverse*. Course 11 is completed as an upward spiral about the limb, with *no reverse*, whilst course 12 would be a reversed spiral, coming from above downwards, across the front of the limb. Course 13 is similar to course 11; course 14, to course 12, and so on until the bandage is exhausted. This makes, then, a Figure of 8 Spiral of the Extremities with *alternate* reverses.

Uses.—Similar to those for which the Simple and the Reversed Spirals are employed, and may be used on either the upper or lower extremity. It makes a very secure method of dressing, and gains this advantage through this fact: that the superficial courses (the reversed ones) rest upon cloth, and *not* upon the slippery integument, as in the case of the other bandages. The same advantage might be gained by covering an ordinary spiral with a second bandage,—an ordinary *reversed* spiral.

This variety of the spiral bandages is especially useful in plaster-of-Paris, starch, or other so-called immovable dressings; also in fractures, or other cases where extension is demanded, and where a long interim between dressings is desirable.

Variety.—If the bandage is composed of very extensible material, as very thinly woven flannel, so as to be easily "moulded to a part," it may be made throughout *without a single reverse.* Each course of the bandage would then be a single figure-of-8 about the limb; thus, turns 7 and 8 would be simple circles of the limb; turn 9, an *upward* spiral, turn 10, a *downward* spiral, turn 11 an upward spiral again, overlapping turn 9; turn 12, a downward spiral, overlapping turn 10, and so on until the limb is sufficiently encompassed.

FIG. 92.

Figure of 8 Bandage of the Extremities.

This also makes quite a firm dress-

ing, as the superficial courses of the bandage rest upon flannel, and not upon the integument. It is used in cases similar to the preceding. It is known as the *Figure of 8 Bandage of the Extremities*, and can be applied, as its name indicates, to either the inferior or superior, extremities.

TRIANGLE OF THE LEG.

Description.—A triangle one yard in length at the base, and eighteen inches in height.

Application.—Place the base of the triangle, A, obliquely across the front of the leg, and carry the superior extremity around below the patella, and confine with a pin, B. Then conduct the inferior extremity around the lower part of the leg, and also confine it, C. Then carry the apex of the triangle around the "calf" of the leg, also confining it with a pin, as at D.

FIG. 93.

Triangle of the Leg.

Uses.—Useful in confining dressings to the parts it covers, and also for maintaining compression, when this may be required.

Variety.—This bandage may be applied to any part of the leg, or even to the arm and forearm, fulfilling similar indications in diseases or injuries of those parts.

FOUR-TAILED BANDAGE OF THE LEG.

Description.—A piece of cloth wide enough to sufficiently cover the diseased portion of the member. This is then to be cut back, at the ends, to near its centre, as you see in the compress (figure 4), upon page 22.

Application.—The plane of the bandage is to be placed over the calf of the leg, and the two superior ends carried forwards, and around the leg, below the patella, and confined. The two

inferior ends are then to be conducted about the lower portion of the leg, and also confined by tying.

Uses.—To confine cataplasmata, or other dressings, upon the gastrocnemial and soleal region.

REVERSED SPIRAL OF THE INFERIOR EXTREMITY.

Description.—This bandage is made from a roller eighteen yards in length by two inches in width.

Application.—Place the initial end of the bandage at the metatarso-phalangeal articulation, and confine by two circular turns about the foot at this point. Continue on about the foot in the same manner, only making a reverse at each course of the bandage, until the ankle is reached, as you see in the wood-cut. Or, it is sometimes best to make the last two or three turns about the foot and ankle in figure-of-8's, as you see in wood-cut number 82, page 99. It is also often necessary to fill up the hollows about the ankles with cotton-wool. Having got so far in the application of the bandage, make three or four spiral turns about the lower part of the leg, courses 15, 16, 17, 18 in the figure, before you begin the reverses about the leg—courses 19 to 30 inclusive; you then come to the knee, which may be covered in by The Testudo, figure 89, page 103, or the simple spiral turns, 31, 32, 33, 34 and 35 in the cut. Having cleared the femuric condyles, you then make spiral reverses to the hip, where you confine the bandage in the usual way.

FIG. 94.

Reversed Spiral of the Inferior Extremity.

Uses.—For all the multitudinous purposes that such an injured or diseased member may demand. The same caution should be observed here as was spoken of under the Reversed Spiral of the Superior Extremity, page 72.

FIG. 95.

Perforated Reversed Spiral of Inferior Extremity.

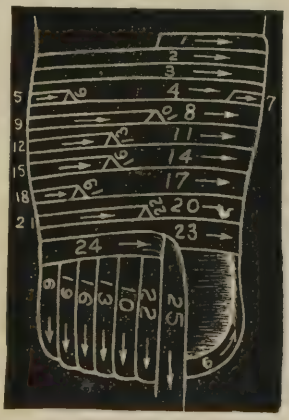
Variety. — As a variety of the "reversed spiral" of the inferior extremity, you have the bandage shown in Fig. 95. This is made from the Perforated Adhesive Bandage of Grosvenor & Richards. It is to be applied in a similar way to the ordinary "roller" just described; the only difference being that the bandage will not need to be as long, as the several turns do not need to overlap each other as much as when the non-adhering bandage is employed. This is much better than adhesive plaster, as the plaster would adhere to and irritate the skin. Then, too, the non-porousness of the adhesive plaster would allow more sweating of the limb than does the perforated bandage here shown. This makes a much firmer support than does the ordinary roller of cotton or flannel.

RECURRENT FOR AMPUTATED THIGH.

Description. — This bandage should be twelve yards in length by one and three-quarter inches in width.

Application. — Place the initial end, 1, upon the front of the thigh, and confine by three horizontal circular turns, 2, 3 and 4. Continue the course of the bandage about the limb, horizontally, finishing turn 5 at the lateral border of the member. Reverse the bandage *at a right angle*, and continue course 6 down the limb, across the stump, then up to the fourth

FIG. 96.



Recurrent for Amputated Thigh.

course of the bandage, thus finishing turn 6. Reverse, now, the bandage at a right angle again, and encircle the member for turn 7, finishing it, anteriorly, at the middle of the limb, as course 8. Continue the bandage on in the same course to finish turn 9 upon the member's anterior surface. Again you reverse at right angles, and carry the bandage longitudinally down the limb and across the stump, thus making the tenth course of the bandage. The remaining courses of the bandage are applied similarly to those just described. At last, when the stump is covered, and the bandage exhausted, confine in the usual way, by pinning.

Uses.—For confining dressings to a "stump." Is somewhat "tedious" of application, and hence the two following bandages are to be preferred to it.

Variety.—This bandage is equally applicable for any stump of the leg, or of the upper extremity. It would then be of the same width, but somewhat shorter. It would then be known (from its respective uses) as *The Recurrent for an Amputated Leg; The Recurrent for an Amputated Forearm; The Recurrent for an Amputated Arm.* A somewhat similar Recurrent has been devised for a hip-joint stump, and also for a shoulder-joint stump. The same objection holds good against these bandages, as the one just described, viz: rather more ornate than useful.

TRIANGLE FOR THIGH STUMP.

FIG. 97.

Triangle for Thigh Stump.

Description.—This should be a triangle having a base one yard in length, and a height of eighteen inches.

Application.—Place the middle of the base of the triangle, A, upon the anterior surface of the thigh, at a proper distance from the cut surface; carry the two extremities backwards about the member, and

bring them forwards, after crossing them, to pin at the front, B and C. Carry, then, the apex of the triangle directly across the stump and up the posterior surface of the limb, pinning to the crossed extremities, B and C.

Uses.—This is a very convenient bandage for protecting a stump from injury from clothing and the like, and also for confining cataplasmata.

Variety.—By varying the size of the triangle, it can be applied to any stump of either the upper or lower extremity. It would then be known as *The Triangle for Leg Stump*, *The Triangle for Arm Stump*, etc., according to the part upon which it might be applied.

MALTESE CROSS FOR THIGH STUMP.

Description.—I. A piece of lint, or cloth, sixteen inches square, cut to the form of a Maltese cross, see Fig. 7, page 25.

II. A roller two yards in length, by two inches in width.

FIG. 98.

Maltese Cross for Thigh Stump.

Application.—Place the centre of the cross, A, over the centre of the stump, and fold the edges over each other, B and C, as you see in the wood-cut, so that they may lie as smoothly as possible. Then confine with the roller by the use of circular turns about the limb, using reverses, if need be.

Uses.—Similar to the Stump-triangle, and equally useful and easy of application.

Variety.—By varying the size of the cross, and the roller, this bandage is equally applicable for any stump of either extremity. It makes most an excellent dressing for hip or shoulder-joint stumps. It would then be *The Maltese-cross for Leg Stump*, *The Maltese-cross for Arm Stump*, etc., according to the uses for which it is employed.

CAPUTINA.

(Rosette Stump Dressing.)

Description.—Take from nine to fifteen strips of cloth (according to the size of the stump), having each one one and three-quarter inches in width, by two and a-half feet in length.

FIG. 99.

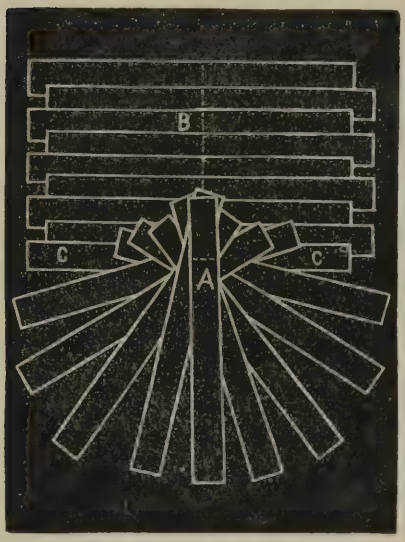


Diagram of the Caputina.

These strips are to be placed in two groups. One set should be so arranged as to form a half rosette, A, whilst the others should be arranged in a parallel group, B, each strip slightly overlapping its fellow. The half-rosette, including one strip parallel with the second set, is made secure with a pin, or stitches, at the point of radiation of the different pieces, called its center, as A. The horizontal strips of parallels may now be stitched together at their centers, though this is not necessary. The whole bandage is then spread upon a newspaper. The horizontal strip, C, of the rosette is laid upon the first piece of the parallel strips (so that the set of parallels becomes but an extension of the rosette), and fastened to it. The object of spreading it upon the paper is only for convenience in carrying and handling.

Application.—The stump is now made ready for this final bandage. The *centre*, A, Fig. 99, placed opposite the medium line of the under surface of the stump, at a point some six inches from its end, and confined there by the long cross strip, C–C, which encircles the member. The remaining portions of the rosette are then laid, smoothly and successively, over

the stump, covering the end completely. The bandage is then finished by passing the horizonta parallel strips, B, over the remaining portion of the limb, securing the free ends of the rosette that are folded over its anterior surface, thus completing the dressing which is represented, as applied to a thigh-stump, in figure 100.

Fig. 100.

Caputina Applied.

These parallel strips may be used more or less extensively upon the limb, as the exigencies of the case may seem to demand. This bandage is really but the extension of the principle of that of Scultet's, the whole upper portion, B, Fig. 99, being but the bandage of Scultet.

Uses.—This bandage is used only in the dressing of stumps; and it is particularly valuable where pressure is required,—as when the flaps retract, making the wound gape, and thus leaving the bone exposed. In its application the stump needs be lifted but *once*, *i. e.*, when the bandage, lying upon the paper, is first slipped under—a *desideratum* wanting in all other stump-dressings.

TARSO-PATELLAR CRAVAT.

Description.—I. Two cravats, each one yard in length.

II. A third cravat one-half the length of the others.

Application.—Tie the smallest of the cravats about the instep, as A. Take, then, one of the remaining, place its centre, B, above the patella, and carry both ends backwards around the lower portion of the thigh, crossing them at the back, and bringing them diagonally downwards and forwards, below the patella, there tying. Take, then, the third cravat and carry it through to its centre, C, the "stirrup" formed by the one first

Fig. 101

Tarso-patellar Cravat.

applied, A, and conduct each extremity, one upon each side of the leg, up and under the loops of the one applied at the patella, B. Flex the foot, to a sufficient degree, upon the leg, and then fasten the cravat last applied by pinning the extremities.

Uses.—Mayor proposed this bandage for cases of knee-pan fractures. It is more suitable in cases of the rupture of the ligamentum patellæ, in transverse wounds of the instep, and in cases of talipes equinus, where extension of the tendon Achillis is required; or, after its division, to properly confine the foot that it may overcome this deformity.

TARSO-CRURAL CRAVAT.

Description.—I. Two cravats, each one one yard in length. II. A third cravat eighteen inches in length.

Application.—So similar to that of the preceding that no wood-cut is necessary; the only difference being that the second one (B, in the preceding figure) is to be applied about the upper portion of the thigh, and to this the long cravat C (of the preceding cut) is to be fastened, after it has been passed through the cravat-stirrup, A, about the foot.

Uses.—The mechanism of this bandage is to forcibly flex the foot, and at the same time the leg, upon the thigh ; and hence is useful in cases of rupture of the soleus or gastrocnemius muscles, or their common tendon, and in transverse wounds of the back of the heel or leg.

Variety.— *Tarso-pelvic Cravat.* The only difference here being that the cravat is tied about the pelvis instead of about

the upper portion of the thigh. The uses are identical to those of the Tarso-crural.

SCAPULO-TIBIAL TRIANGLE AND CRAVAT.

(*Sling for the Inferior Extremity.*)

Description.—I. A cravat, or scarf, two yards in length.

II. A triangle whose base measures one and one-half yards, and whose height is two feet.

Fig. 102.

Scapulo-tibial Triangle and Cravat.

Application.—Tie the scarf over the shoulder opposite the injured leg, as A. Place the base of the triangle, near its middle, at the anterior surface of the leg, B, and carry the two ends upwards and tie into the "sling" formed by the cravat. Then pin the apex of the triangle at the outer side of the leg, to the base of the triangle, as at C; folding it across the front of the knee, so as to prevent the member slipping too far forwards, and out of its support.

Uses.— To support either lower extremity, when injured; or to hold, moderately flexed, the leg upon the thigh. Is a very convenient and useful dressing.

SLING OF THE LOWER EXTREMITY.

Description.—A cravat long enough to reach from the neck to the foot, and back again, to tie about it. It is also made from webbing, with a buckle attached, as represented in the cut.

Fig. 103.

Sling of the Lower Extremity.

Application.—The limb having been properly bandaged, the cravat or webbing, at its centre, is to be passed underneath the foot, and then tied about the neck.

Uses.—As a support, merely, of an injured foot, leg, knee, or thigh, when walking with crutches is allowable.

CROSS OF THE GROIN.

(*Ascending Spica of the Groin.*)

Description. — This should be made from a roller nine yards in length by two inches in width.

Application.—Place the initial end of the bandage at the front of the abdomen, 1, and confine by the two horizontal circular turns, 2 and 3. Continue in the same course till you come to the ilium of the injured side, when you descend obliquely across the inguinal region, passing down between the thighs, thus completing the fourth course of the bandage. You then encircle the thigh of the same side, and, on coming to its anterior surface, ascend obliquely across the inguinal region, from without inwards, upon the abdomen, to the opposite side of the body, thus completing the fifth course. Course 6 is made similarly to course 4; course 7, to course 5; course 8, to course 6; course 9, to course 7;

Fig. 104.

Cross of the Groin.

and so on until the roller is nearly exhausted, when you make one or two horizontal turns about the abdomen, and confine.

Uses.—For maintaining dressings upon the inguinal region; also for making compression upon any of the enlarged glands in this neighborhood, and for maintaining a replaced hernia.

Variety.—*Descending Spica of the Groin.* This differs from the preceding only in having the courses of the bandage across the groin run from above downwards; that is, course 4 of the bandage is put in the line of course 16 ; course 5, in the line of course 17; course 7, in the line of course 15, and so on.

TRAPEZOIDAL T OF THE GROIN.

Description.—I. A piece of cloth, cut to the shape of a trapezoid, sufficiently large to cover the groin.

II. To one of the angles of the base of this trapezoid, the external superior (as A in the following figure), stitch a small roller, two yards in length by one and three-quarter inches in width.

III.—To the other extremity of the base, B, stitch another roller of the same width, but three yards in length.

IV. Across the apex of the trapezoid stitch another roller, having the same width, but being two feet in length, as at C.

FIG. 105.

Trapezoidal T of the Groin.

Application.—Place the base, A–B, of the trapezoid above the injured groin, and encircle the abdomen with the roller A, as A'. Conduct the roller B across the crest of the opposite ilium, then diagonally downwards across the sacrum and nates to a point considerably below the great trochanter, and then obliquely upwards across the trapezoid, as B', and the abdomen, to pass around the back again, and tie with the portion A at the side. Pin the portion B' to the trapezoidal

piece of lint, and also to the roller-turn, A'. This done, encircle the thigh with the roller from the inferior portion of the trapezoid, as at C, confining it with a pin.

Uses.—For confining cataplasmata and other dressings to the groin and anterior surface of the thigh, when the patient is kept in the recumbent posture. Is of little or no value in exercising compression, and hence does not, in this particular, take the place of the Spica of the Groin just described.

CRURO-INGUINAL TRIANGLE.

Description.—A triangle one yard in length across its base, and some eighteen inches in height.

Application.—Place the base of the triangle A, just above and to the inside of the anterior spine of the ilium, the right for example, in an oblique manner; carry, then, the internal (inferior), extremity about the injured thigh, from within outwards, and pin, as at B. Then conduct the other extremity around the body, bringing it forwards and obliquely downwards across the opposite inguinal region, C, and pin to the base of the triangle. The apex is then to be carried backwards and downwards across the gluteal region of the injured side, and confined as usual.

FIG. 106.

Cruro-inguinal Triangle.

Uses.—This bandage of Mayor's is very useful in confining dressings to one of the nates, upper part of the thigh, or one of the inguinal regions.

Variety.—The *Cruro-pelvic Triangle* is made, essentially, in the same manner; the only difference being that the base of the triangle is applied farther up upon the abdomen, thus adapting it more especially for confining dressings about the crest of the ilium, and the lower lateral portion of the abdomen.

CRURO-PELVIC CRAVAT.

(*Inguinal Cravat.*)

Description.—A wide cravat one yard in length.

FIG. 107.

Cruro-pelvic Cravat.

Application. — Place the middle of the cravat at the pubic region, as A; carry, then, the superior extremity, or the one to the opposite of the diseased side, obliquely up across the opposite inguinal region, over the iliac crest, and around the back; then conduct the other extremity about the thigh of the injured side, as B, mounting up across this inguinal region, and at last tie with the other extremity at the side, as at C.

Uses.—For confining dressings upon the supra-pubic, inguinal, and lower gluteal regions.

SACRO-BI-CRURAL CRAVAT.

Description.—Two cravats, each four feet in length. Tie them together at one of their extremities.

FIG. 108.

Sacro-bi-crural Cravat.

Application.—Place their point of tying at the lumbo-sacral region, bringing both free extremities, A and B, forwards and downwards across the inguinal regions, one upon each side ; then pass them in between and around the thighs, and conduct them obliquely upwards and across the ilio-pubic regions, A′ and B′, to confine them there with pins.

Uses.—For confining dressings upon *both* groins, as in cases of bilateral buboes.

DOUBLE T OF THE PERINÆUM.

Description.—I. A broad band, long enough to encircle the body.

II. Two strips, each one yard in length by two inches in width, sewed at right angles to the broad band, one inch from each other, at its central portion.

FIG. 109.

Double T of the Perinæum.

Application. — Place the centre of the broad band at the lumbo-sacral articulation, and confine it about the body, as at A.

Bring forwards, between the thighs, each of the other strips, and pin them to the broad portion of the bandage, as at B and C.

Uses.—To maintain dressings upon the sacrum, anus, perinæum, and vulva.

Variety.—*Simple T of the Perinæum.* This differs from the above only in having a single perinæal strip. Is used for the same purposes for which the double T is employed.

PERINÆAL CRAVAT.

Description.—I. A broad bandage to encircle the abdomen, as in figure 109.

II. A cravat two feet in length.

Application.—Having applied the abdominal band, as in the preceding cut, A, pin (or button) one end of the cravat to the sacral portion of the broad band; pass the other extremity between the thighs, and pin at the pubic portion of the band.

Uses.—Similar to the "T Bandages of the Perinæum." Ladies make use of this cravat for protecting themselves against the menstrual flow.

SACRO-PUBIC TRIANGLE.

Description.—This should be a triangle one yard in length, by eighteen inches in height.

110.

Sacro-pubic Triangle.

Application. — Place the base of the triangle, A, at the lumbo-sacral region, with the apex downwards, and carry the two extremities forwards around the body, tying or pinning, at the front. Then carry the apex, B, of the triangle forwards between the thighs, and pin, at the pubes, to the tied extremities.

Uses.—To maintain dressings upon the sacral and lower lumbar regions, the perinæum, vulva and anus.

FOUR-TAILED BANDAGE OF THE HIP.

Description.—A piece of cloth one yard in length, by eight inches in width, torn to a four-tailed bandage; see figure 4, page 22.

Application.—Place the plane of the bandage over the diseased hip, and carry the two superior ends around the pelvic brim, and confine by tying. Then conduct the two inferior extremities about the upper portion of the thigh, of the side diseased, and fasten as usual.

Uses.—To confine cataplasmata and similar dressings, to the parts it covers.

COXO-PELVIC TRIANGLE.

(*Triangular Bonnet of the Nates.*)

Description.—I. A cravat four feet in length.

II. A triangle having a base one yard in length and a height of eighteen inches.

Application.—Encircle the lower portion of the abdomen with the cravat D, and confine by tying. Then place the middle of the base of the triangle, A, below the great trochanter, with the apex upwards; then encircle the thigh with the free extremities of the base, and confine by tying as at B. This done, carry the apex of the triangle upwards, and confine it to the cravat, as you see in the wood-cut, at C.

Fig. 111.

Coxo-pelvic Triangle.

Uses.—To retain soft dressings to the parts it covers.

LUMBO-SCROTAL TRIANGLE.

(*Suspensory Bandage of the Scrotum.*)

Description.—I. A cravat sufficiently large to encircle the body.

II. A triangle having a base of fourteen inches and a height of ten inches.

Application.—Tie the cravat, A–A, about the lumbo-hypogastric regions. Place the base of the triangle close up to the pubes, beneath the scrotum, and carry the ends, B, B, up over the cravat, then down beneath it, and forwards again, as you see in the cut, and tie in front, as D. Carry the apex of the triangle upwards across the front of the scrotum, passing beneath the tied extremities, and beneath the cravat, and fold down over and in front of the cravat, confining with a pin.

Fig. 112.

Lumbo-scrotal Triangle.

Uses.—As a suspensory bandage for the scrotum, and its contents, and as a retainer of dressings to the parts.

BOURSE OF THE SCROTUM.

Description.—I. A piece of cloth, folded to a double square, six or eight inches in size. Cut off the folded corners by the dotted lines, A–B, and C–D, in figure 113. It is then to be stitched across, from A to B, and from C to D.

FIG. 113.

Bourse of the Scrotum.

II. Around the upper portion of this, E–D–E′, is to be stitched, at its central portion, a roller two inches in width by four feet in length.

III. To each inferior extremity, A and A′, there is to be stitched a roller one inch in width by two feet in length.

Application.—Place the scrotum in the bourse, and draw the penis through the opening left at D, C. Conduct the broad band around the body, and confine by tying. The other two strips that are attached to the inferior portion of the bandage, are to be carried between the thighs, across the perinæum, and up over the buttocks, one upon each side of the body, and confined to the broad band that encircles the abdomen.

Uses.—To retain dressings to the scrotum, or to exercise compression upon its contents; but more especially as a suspensory bandage. Rubber makes a good substitute for the linen bourse when compression is demanded, as proposed by Richard and Nélaton, in cases of voluminous varicoceles and sarcoceles. Nélaton employed, in these cases, small *tubes caoutchouc vulcanisé*, and by so doing forestalled the American surgeon in a similar use of the *capote*. Compression can also be maintained by the use of adhesive strips, which method is fully described in the Chapter upon Strappings.

DOUBLE T OF THE TRUNK.

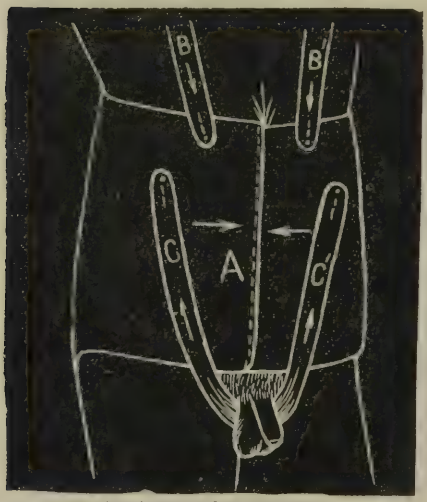
Description.—I. A large, quadrilateral portion of cloth to encircle the abdomen.

II Two strips, sufficiently long to pass over the shoulders, to act as "suspenders."

III. Two strips of the same length to be passed across the perinæum.

Application.—Having encircled the abdomino-lumbar regions with the broad quadrilateral portion of the bandage, pass the two portions, B, B′, of the bandage from the posterior to the anterior surface, and confine with pins to the main bandage. Then, pinning the remaining two strips to each lumbar region of the broad bandage, conduct them forwards, across the perinæum, and upwards to the abdomen, there to confine; having care to have crossed them upon the perinæum, so that the strip fastened upon the right of the patient, posteriorly, shall be fastened upon the left, anteriorly, etc.

FIG. 114.



Double T of the Trunk.

Uses.—As a dressing after paracentesis abdominis, or eviscerating wounds. Also, as a retainer of pubic and perinæal dressings.

NOTE.—For the *Spiral of the Abdomen*, see page 82 ; and for the *Circular-Quadrilateral of the Abdomen* (and *the Abdomen and Thorax*), *and the Dorsal Cervico-Sternal Triangle*, see page 83.

The *uses* of these bandages are similar to those for which the Double T of the Trunk is employed.

CHAPTER XI.

IMMOVABLE DRESSINGS.

This variety of surgical dressing has long been known to the profession. The Father of Medicine, Hippocrates, was quite conversant with the use of this apparatus, and used it in most cases of fractures. His teachings upon the subject seem to have been lost sight of, however, during the many centuries that have followed him, and so the introduction of this style of dressing, during our later years, has been accredited to the *reviver* as a new discovery. *Resurgam* is the epitaph of all things surgical, and the history of the succeeding ages is but the unfolding of the truthfulness of the prophecy. In other words, a modern inventor (so-called) can hardly hope to be anything further than a reviver of some forgotten principle.

The stiffening substance made use of by Hippocrates, was wax, rosin, and cerate, instead of the plaster-of-Paris, starch, dextrine, etc., made use of by the moderns. This was well rubbed into the bandage, and upon each succeeding turn of the applied roller, besides being applied to the compresses, packings, and even the limb itself.

Mr. Eaton, the English Consul at Bassora, introduced the knowledge of these hard plaster bandages to the English public in 1798, and Pirogoff, in 1854, during the Crimean war, used it very extensively.

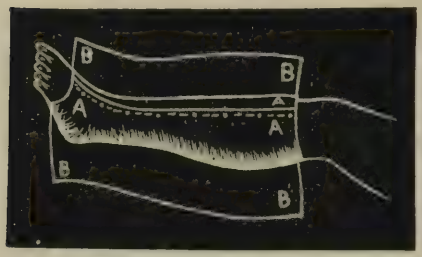
THE BAVARIAN PLASTER SPLINT.

Description.—Take two pieces of Canton flannel, of length sufficient for the injured member, and of width sufficient to overlap slightly when brought around the limb. Those for the leg would resemble the pieces of the leg of a stocking when it is cut vertically. The pieces should now be

stitched together at the back, one to the other, down the median line.

Application.—Spread the bandage out under the limb, so that the stitched portion will correspond to the back of it; carry, now, the upper piece about the limb, and fasten by stiches or pins, as you see in the wood-cut, Fig. 115, A, A, A. The member now being firmly held, an assistant mixes the plaster-of-Paris with about an equal bulk of water. This is then poured over the limb, when it is enwrapped with its covering, A, A, A, and evenly distributed over its surface. The edges B, B, B, B, of the other piece of flannel are then caught up and brought forwards around the limb, and confined by a suitable roller, or by straps. The plaster soon hardens, and then the edges of the bandage may be trimmed, the portion pinned or sewed can be unfastened, and you have then an excellent splint for a member. The stitching at the back plays the office of a hinge, thus facilitating its removal and application.

Fig. 115.



The Bavarian Plaster Splint.

Caution.—In this, and all other hard dressings intended to remain some time upon the limb, you must guard all unevennesses of the member, as the region of joints, etc., with abundant layers of cotton-wool, as the bandage is apt to contract slightly after its application, thus engendering gangrene. Generally it is best to wait three or four days after simple fractures, as of fibula or tibia, with no displacements, before the strictly immovable dressing is applied. In other cases ten or twelve days is the usual time recommended by authorities.

Uses.—As a support to a dislocated member, fractured bones, or separated cartilages; also in inflammation of joints when "absolute rest" is to be sought.

If there should be any undue swelling of the limb, or overmuch pain be caused by the pressure of the bandage, of course it should be at once removed. The following rules, from Hippocrates, are clear and decisive, and form an excellent guide for the surgeon in bandaging, either with the movable or immovable apparatus.

Quoting from *Περὶ Ἀγμῶν* § 5: "These are the signs if the patient has been properly bandaged: if you ask him if the limb feels tight, he says it does, but moderately so, especially about the seat of fracture. And these are the symptoms of a moderately tight bandage: for the first day and night the patient fancies the tightness does not diminish, but rather increases; on the next day there is a soft swelling [œdematous] in the hand, or foot, for this is a sign of moderate compression; but at the end of the second day the compression should feel less, and by the third day the bandage should seem loose. If any of these symptoms be wanting, you may conclude that the bandage is slacker than it should be; or, if any of them be in excess, you may infer the compression is more than moderate [*i. e.* hurtful]."

THE COMMON PLASTER DRESSING.

(*Pirogoff's Plaster Bandage.*)

Description and Application.— Having first well padded the limb with cotton-wool, envelop it with a flannel roller, neatly, evenly, and somewhat tightly. Then make your plaster ready, by getting it to the consistency of cream, by adding to it about an equal bulk of water (mixing up but one-half a teacup of it at a time); into this mixture dip the pieces of muslin (thin) that you have prepared, in suitable strips and squares, and begin laying them evenly around the limb. As soon as the plaster-mixture begins to harden in the dish, throw it out and mix up a new batch, continuing the application of the muslin strips, as before. You will find strips two to four inches in width, and long enough to go one and one-half times about the member, the most convenient size for applying, ex-

cept in the region of joints ; here squares, or oblong squares, are very serviceable. When you have the whole to the requisite thickness to furnish efficient support to the member, encase the whole dressing with a layer of the gypsum, by pouring a portion upon the limb enveloped with plaster-cloths, along its entire length.

The same cautions should be observed here as in the preceding variety, remembering this is a *permanent* dressing. The limb should be kept immovable during the application, and *very* quiet for some time afterwards, so that the plaster may not be cracked whilst hardening. After this, if the condition of the patient permits, the member can be swung in a "sling," and the patient permitted to walk or ride out, with little or no danger.

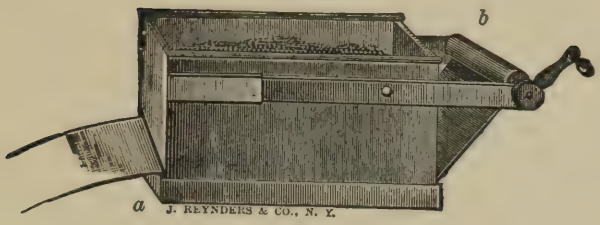
Uses.—These are similar to those just enumerated under the Bavarian bandage.

It might be well to notice that the *hardening* of the plaster can be *delayed* by the addition of a little stale beer, or size, to the mixture ; or it can be *accelerated* by the addition of sodic chloride (common salt), alum or by using warm water to "wet it up." It is best to paint the whole, after it is dry, with an application of glue, varnish or albumen, so as to prevent "chipping" of the exterior. This bandage is also made of of starch.

STARCH, OR PLASTER ROLLER.

Description.—Having a bandage (of the required length and width) of some meshy or loosely woven material, as cheese cloth, fill the meshes of it with the powdered gypsum, or starch, by rubbing it in, and then roll up firmly and evenly. A little machine has been invented for the purpose of facilitating the manufacture of this very useful form of dressing. This is shown in Fig. 116. It consists of a narrow box, with an opening in the end at *a*, through which the cloth is introduced, after the ravellings are carefully removed from the sides ; it then passes over a roller, so as to ensure an even dis-

FIG. 116.



tribution of the plaster overlying it, and out at the opposite end of the box to be wound upon the roller, *b*. A cover fits over the box when in use, and when not in use the outside roller and the crank can be detached, and the crank arms shoved back on the box, so as to make an easily portable apparatus. The plaster, in all these bandages, should be *fresh*, and *finely ground;* otherwise there will be difficulty in their properly hardening. They can be rolled up in quantities, if you desire, if you will keep them excluded from the air, in a tight tin pail, and covered over with loose plaster-of-Paris.

In this form, the plaster rollers may be made five or more inches in width, and then cut to the desired width when wanted for use.

Application.—When you are ready for applying the rollers above described, dip them into a pail of warm alum water ; the alum increases the quick-setting, or hardening, of the plaster-of-Paris. There should be about an ounce of alum to the pint of warm water. The bandages should soak a while in this, then the water should be *thoroughly* squeezed out from the roll, when it is ready for application to the limb of the patient. Have the limb protected with a thin layer of cotton-wool, then apply the wetted bandage quickly, though smoothly and evenly about the member, just as you would a common "spiral," or reversed bandage, to the same member. It quickly hardens, and you have then quite a firm casing for your patient's limb. It is not quite so secure or firm as the Starch or Plaster Dressing just described, yet is very useful, as it is so much lighter.

Varieties.—The roller may be prepared as above, and on each succeeding turn of it about the member, it may be freely

brushed over with the plaster-cream, starch, gluten, silicate of potash, glue, or whatever hardening substance is used, as in the method employed by Hippocrates when using his compound of rosin, wax, and cerate; at last, brush the whole over with a thin layer of the substance made use of.

In all of these "hard" bandages, it is well, a day or two after their application, to give the whole a coating of varnish, gluten, or gum, in order to prevent the bandage "chipping." This form of *plaster* dressing was introduced in 1854 by the Dutch surgeon Maythysen.

The *Banddge of Scultet* has also been made use of to make the "immovable dressings;" but it is not secure enough to come into general use. It is the parallel strips seen at B, Fig. 99, and is to be similarly applied.

The Silica Bandage is now considerably used. It dries more readily than the gypsum, and possesses the advantage of being soluble in water, hence quite easily removed.

The Paraffin Bandage of Mr. Tait is recommended for open wounds, as it does not absorb the secretions as do the other varieties of dressings. The substance is kept melted by having its container in hot water. The roller is to be passed through it as it is applied.

FENESTRATED IMMOVABLE DRESSINGS.

Description.—Any of the preceding varieties of immovable bandages may have openings left in them through which the secretions may find ready exit.

It would be well to coat the margins of the fenestræ, for some distance around them, with paraffin, so as to prevent the absorption of the fluids by the dressing. If the paraffin should happen to crack, it can be easily mended by passing a hot spatula over it.

Dr. Pennington suggests, as a method for preventing the discharges from passing between the skin and the hard dressing, the application of a piece of oil-silk beneath the wound, causing it to adhere to the skin by the free use of ordinary

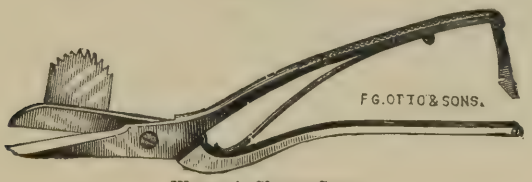
collodion. The oil-silk is then drawn out over the edges of the fenestræ, and so furnishes an easy egress for the fluids from the wound, at the same time protecting the bandage. The oil-silk is secured by first brushing over the skin the ordinary collodion, and then applying the oil-silk, and finished by applying another coat of collodion on the surface of the oil-silk.

Uses.—These are applied in cases of compound fractures, open or suppurating joint-troubles, where a discharging surface would otherwise be covered in by the dressing.

REMOVING "IMMOVABLE" DRESSINGS.

For assisting in the removal of these various hard dressings, shears, saws and knives, of sundry patterns, have been devised. Probably as handy a tool as any is *The Shears-saw*, designed by Dr. Watson, of Jersey City, and which is shown in Fig. 117. It consists of Henry's shears slightly modified, *i. e.*, made much lighter, less curved, and blades of equal length, with a convex saw-blade attached to the upper blade. As most of the sawing is done on the pull, the teeth are pointed backward. In using

FIG. 117.



Watson's Shears-Saw.

this instrument for removing plaster bandages, you make two parallel incisions with the saw about one-third of an inch apart, on any convenient aspect of the dressing, through the plaster to the muslin from end to end of the plaster. The strip of plaster between these incisions is easily removed by using the lower blade of the shears as an elevator, after which the muslin is readily cut through with the shears.

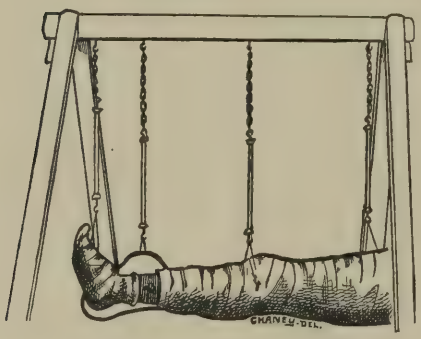
Nitric Acid.—Dr. F. H. Murdock, of Bradford, Pa., says a very convenient way to remove a plaster-of-Paris bandage is as follows: Take a strong solution of nitric acid, and by means of a camel's hair pencil paint a strip across the bandage at the

most desirable point for division. The acid will so soften the plaster that it may be readily divided by means of an ordinary jack-knife.

TREATING COMPOUND FRACTURES.*

Plaster-of-Paris is a valuable adjuvant in the treatment of compound fractures. The plaster cast, with fenestrated openings opposite the site of the wound, is a decided improvement over the movable splint; yet this has its disadvantages, owing to the fact that the discharges from the open wound soften the plaster and weaken its support, necessitating its re-application before the union of the bone takes place. This may be obviated by using paraffin or oil-silk, as just described, or by the device shown in Fig. 118.

FIG. 118.



Compound Fracture of the Leg.

The application of the plaster-roller is similar to that already described, remembering that the parts to be covered with plaster should first be covered with one or more thicknesses of cotton batting, to allow for any swelling that may occur.

The first step to be taken before the application of the plaster, should be a thorough examination of the conditions of the fracture (the patient being, of course, under the influence of an anæsthetic). We are now ready for the application of the plaster-bandage. It should, in case of injury of the lower extremity, extend well up above the knee, also on the foot, leaving that part where the wound exists perfectly free, as in Fig. 118. As soon as the plaster is solid, which will be almost imme-

* This is altered and condensed from a pamphlet by Professor H. O. Walker, M. D., of Detroit, upon the subject of Plaster Dressings.

diately, you can, by the aid of your assistant, make proper extension and counter extension, with the splints, A and B, Fig. 119, which can be adjusted and fastened with a few turns of a narrow, wet plaster-bandage. The splints, you observe, consist of properly shaped iron bars of sufficient strength to support the weight of the leg, and not permit of bending. To each end is fastened a properly shaped piece of perforated tin, or zinc. Any blacksmith can make these splints from a model that you can make yourself by taking strips of tin and bending them to the shape to which you wish to apply them. You must allow for sufficient space between the iron bars and the leg to apply an antiseptic dressing.

Fig. 119.

Fig. 118 gives a representation of the manner of suspension consisting of a light-made saw-horse; or, what may be much better, a piece of board of proper length, one inch in thickness and two in width, into which is fastened, at either end, a screw-hook and suspended to the ceiling. On its under surface three or more hooks should be screwed for the fastening of small chains, and these again fastened equably to fine wire hooks, which have been incorporated in the plaster. You will observe in the cut that rubber tubing has been used for the suspension; this adds very materially to the comfort of the patient.

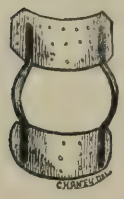
This apparatus makes an immovable dressing, which can remain on until the case is cured, giving comfort to the patient, allowing him to be moved from the bed to the chair if desired, and certainly reduces the labor of the surgeon to a minimum. If you desire to increase or decrease the amount of extension, this can be done by incorporating in the bars, above and below the joint, the extension screw C, Fig. 119.

In the Treatment of Hip-joint Disease, plaster-of-Paris proves of value, especially in the first stage where absolute rest is desirable, and is best applied while the patient is suspended by a Sayre's apparatus (see page 137), the well foot standing on a chair, and the other supported or extended by an assistant. The plaster extends from the ankle to the umbilicus,

and is made firm at the trochanter by interlacing perforated tin strips; or, what is still better, thin strips of hickory or any elastic wood, well soaked for a few hours before using.

Where exposure or extension of the joint is necessary, the apparatus depicted in Fig. 120, which consists of curved bars of iron attached above and below to proper sized pieces of perforated tin, should be applied over the joint, and the whole held in place by a few turns of a wet plaster-bandage.

Fig. 120.



Where motion, as well as extension, is desired, the application of Stillman's "Sector Splint" serves a good purpose (see Figs. 121 and 122). It admits of the patient's walking about, and also allows: 1. Extension at any angle with motion. 2. Extension at any angle with fixation. 3. Fixation at any angle. 4. Motion, complete or limited, constant or occasional. 5. Exposure of surface about joint, admitting compression, elastic or otherwise, hot and cold applications, blisters, dressing and easy inspection. 6. Motion, extension, and elastic tension by the addition of appropriate rubber cords.

Fig. 121.

Stillman's Section Splint.

Fig. 122.

Same as Applied.

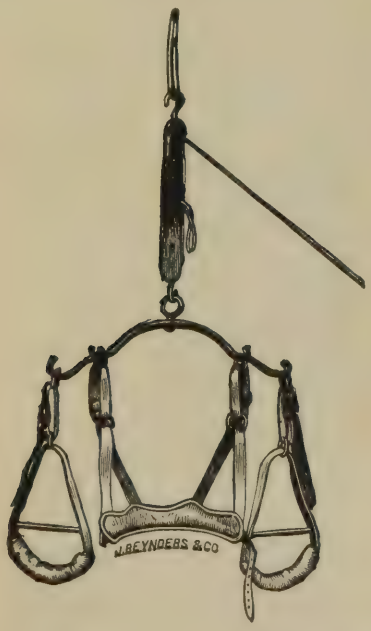
These "Sector Splints" may be applied to either the hip or knee, and devices of a similar character are applicable for the treatment of a majority of joint troubles having for their basis of attachment plaster-of-Paris.

SAYRE'S PLASTER BANDAGE FOR THE SPINE.

To Professor Lewis A. Sayre, M. D., of New York City, the medical profession is under more obligations than to any other man for the introduction of the use of plaster-of-Paris as a curative dressing for spinal and joint troubles. His method of application of the "Plaster-of-Paris Jacket" for spinal troubles is given herewith as condensed from the *Transactions of the American Medical Association.*

Description.—The patient is to be suspended by means of an apparatus, prepared for the purpose (see Fig. 123), consisting of a curved iron bar with hooks at either end, from which pass straps that are attached to pads that go through the axillæ, and also under the occiput and chin, and are capable of being made shorter or longer, according to the length of the patient's neck. The iron bar is suspended from the ceiling by means of a compound pulley, through which gradual extension can be made until the patient is drawn up so that the feet swing clear from the floor.

FIG. 123.

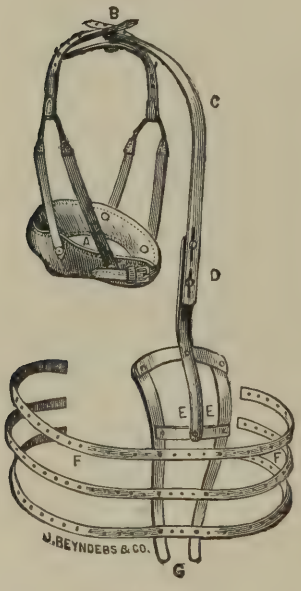


Previous to the suspension, however, a thin flexible leaden strip should be laid upon the spinous processes for the entire length of the spinal

column, and bent into all the sinuosities, so that it may take a perfect outline of the deformity. This strip is then laid upon paper and its outline marked with ink, and we have a perfect mathematical outline of the irregularities along the spinal column. After the patient has been suspended, the same leaden strip should again be applied along the spinous processes, as in the first instance, and another pattern made upon paper, by the side of the first. We thus have a means by which comparison can be made, and so are able to determine exactly what changes have taken place in the curve.

The shirt, which should be woven, or knit, without seams, and tightly fitting the body, is next pulled down, and an opening made in front and rear, through which a ribbon or piece of bandage is passed, for the purpose of holding in place a handkerchief placed in the perinæum, and at the same time making the shirt fit the hips exactly; for the tighter the shirt fits, the less number of wrinkles there will be in it.

FIG. 124.



"Jury Mast."

FIG. 125.

"Jury Mast" applied, lateral view.

Application.—With the roller bandages, previously prepared (see page 130) commence by applying one just around the smallest part of the body, going to the crest of the ilium, and a little below it, and lay it around the body smoothly, *but do not draw upon it at all*, having previously placed quite a thick layer of cotton-batting over the stomach, withdrawing the batting on the hardening of the whole. When applying, unroll the bandage with one hand, while the other follows and brings it into smooth, close contact with all the irregularities of the surface, over the ilium, and dipping into the groin, then over the abdomen again and dipping into the groin again, and so on, from below upwards, in a spiral direction, until the entire trunk has been inclosed from the pelvis to the axillæ. After one or two thicknesses of bandage have been laid around the body, in the manner described, narrow strips of perforated tin are to be placed, parallel with each other, upon either side of the spine, from two to three inches apart, and in numbers sufficient to surround the body, and another plaster roller carried around the body, covering them in the manner in which the first bandage was applied. These few strips strengthen the bandage, and obviate the necessity of increasing its weight by the application of a large amount of plaster.

If there are any very prominent spinous processes, which at the same time may have become inflamed, in consequence of pressure produced by instruments previously worn, or from lying in bed, it is well to guard such places by means of little pads of cotton, or cloth, or little glove fingers filled with wool, which is elastic, which are to be placed upon either side of them before applying the bandage.

Another suggestion, which I have found to be of practical value, is to take two or three thicknesses of roller bandage, three or four inches long, and place them over the anterior superior spinous process of each ilium. These little pads are to be removed just before the plaster has completely set, consequently leaving the bony part free from pressure after the soft parts have shrunken under the influence of the continued pressure produced by the plaster-dressing. It is also well, just

before the plaster has set completely, to place one hand in front of the ilium and the other over the buttocks, and squeeze the cast together, so as to increase this space over the bony prominences. In a very short time the plaster becomes sufficiently "set," so that the patient can be removed from the suspending apparatus and laid upon his face, or back, on an air-bed, there remaining until the hardening process is complete. A hair mattress answers a very good purpose, but the air-bed is preferable, especially if there is much projection of the spinous processes, or of the sternum. If, however, the plaster-rollers have been dipped in warm alum-water before applying, the cast will be usually solid enough, by the time you are done, to admit of the patient's walking about.

"JURY MAST."

Description.—In case of disease of the cervical and upper dorsal vertebræ, Dr. Sayre uses the head-suspension (shown in Figs. 124 and 125), or "Jury Mast." This consists of a steel rod, secured to two pieces of malleable steel which are placed on either side of the spine, and which can be bent so as to accurately fit any curve in the plaster-jacket that has already been applied to the entire trunk of the diseased patient, and retained accurately in position by having attached to them three narrow strips of perforated tin, which should be long enough to very nearly encircle the entire trunk, leaving only a central line of an inch or so in width, in front of the body, for the purpose of cutting or sawing down the plaster-jacket whenever it may become necessary to remove it. The central bar is attached, by two cross-bars, to the upper portion of this malleable framework, and is curved over the top of the head to the vertex; and to its extremity is attached a swivel bar, three to five inches in length, from which the head is suspended by adjustable straps secured under the chin and occiput. This upright bar is made in two pieces running into each other at the straight portion behind the neck, and capable of being extended to any desired length, and firmly secured in position by screws.

Application.—To apply the apparatus, the patient is suspended in the usual way, from the axillæ, chin, and occiput, and the plaster-bandage applied, as usual, over a tight-fitting knit or woven shirt. After the bandage has been accurately applied, and the plaster has hardened, or "set," the patient can be permitted to stand up, when the apparatus for suspending the head is to be applied in its proper position, over the back of the plaster-jacket, and the lower portion of it bent and moulded until it accurately fits all its various curves. The loose tin strips, being very flexible, can then be smoothly moulded around the jacket, which has already been applied to the trunk, and another plaster-bandage, having been wetted in alum-water, is to be carefully and tightly applied over the apparatus, and the jacket first applied, in sufficient number of layers to make it perfectly secure. The tin being rough and perforated, a sufficient amount of plaster will be incorporated into its holes and meshes to prevent any possibility of displacement. This makes a secure point of support from the pelvis and trunk from which the head can be sustained by properly adjusting the movable rod and securing it by screws.

Its practical application is seen in Fig. 125, and the ease and comfort to the patient, together with the perfect freedom of mobility to the head, make it a very satisfactory apparatus.

Variety.—Professor H. O. Walker, of Detroit, has made a modification of this "Jury Mast," that is detailed in the following description, condensed from an article in *Leonard's Illustrated Medical Journal.*

In the first place he directs the hair to be cropped short, and then applies a "Plaster Jacket." The plaster jacket in itself is of no benefit whatever save as it serves the purpose of a foundation for the superstructure to be built upon. After allowing the jacket to dry for a few minutes, the patient is seated on a stool, and the head suspended to a hook in the ceiling by a four-tailed bandage, somewhat after the manner of a Barton's fracture bandage for fractured jaw; that is, by first placing a bandage under the jaw, and allowing it to meet several inches above the head, and another in front

Fig. 126.

Side View.

of the jaw, passing back to the occiput, where it is pinned or sewed, then passing the ends of the bandage up to meet those from the front and then up to the hook, using just enough of extension to keep the body erect and patient perfectly comfortable. The surgeon then winds around the neck and head one thickness of glazed sheet wadding, for protection against any irregularities in the plaster-bandage. (The bandages should be narrow, about one-and-a-half inches in width, as it is necessary to reverse quite frequently in this application).

After applying two or three thicknesses, he interlaces perforated zinc strips, half inch in width, extending around the head, down the back and in front, so that a firm support for the head is well attached to the jacket below. The only parts exposed are the top of the head and that portion of the face which you see exposed in Fig. 126.

THE "SILICA JACKET."

The Silica Jacket, as first proposed by Wolff, of Berlin, can be applied in a similar way to the plaster-of-Paris. Some prefer the silica for the jacket, as the silica is readily soluble in water, and chipping is more easily controlled.

Fig. 127.

"Silica Jacket."

After it has become thoroughly hardened, it may be divided over the sternum, as shown in Fig. 127. It is then removed with the shears-saw (Fig. 117), a row of eyelets punched down each divided border, the shell re-lined with cotton-wool, and then the whole re-applied to the patient's body, and laced up.

A layer of cloth wet with the silica should

be applied over the roughened edges of the jacket where it has been cut apart, so as to render the whole as smooth as possible.

This should also be done in all cases of the plaster casts of the limbs whenever they are cut apart, and preserved for a re-application.

Manila Paper Splints.—Dr. R. O. Cowling has suggested taking common manila paper, soaking it well in starch, then carefully moulding it to the parts when it is wet, as a substitute for the starch, plaster, or silica roller. It makes a more serviceable dressing, oftentimes, than pasteboard alone, or even the patent felt splint.

It is well to finish up *all* these various hard dressings with egg albumen, or varnish, so as to reduce the chances of chipping or crumbling to a minimum.

CHAPTER XII.

UPON STRAPPINGS.

In strapping a limb we seek one or more of the following purposes:

I. A "support" to the divided tissues.

II. A compression of the part, so as to favor absorption of effused materials; or, to prevent too exuberant granulation, or herniæ.

III. To gain a fixed point upon the member, so as to be enabled to maintain extension of the same.

For one, or of all of these purposes, the common adhesive plaster of the shops (*Eplastrum Resinæ*) is employed. The formula for its preparation, according to the *American Pharmacopœia*, is:

℞. Resinæ pulveris, ℥ vi;
Emplastri Plumbi, ℥ xxxv.

This often proves irritating to the skin, from the amount of rosin it contains, if the plaster is to be long applied. The irritability of the plaster may be lessened by using less rosin in its making.

Baynton, to whom the profession is indebted for the introduction of the "strapping treatment" of old ulcers, made use of a formula containing but six drachms of the rosin to a pound of the lead plaster, less than one-half the amount used in the officinal formula.

The Dublin College, and also the British Pharmacopœia, incorporate a small amount of soap in their adhesive plaster, thus engendering a greater pliability of the dressing.

The plaster is spread upon heavy muslin, or Canton flannel, by the aid of machinery, and comes to us in rolls of several yards in length. The strips we use should always be cut

lengthwise from the roll, otherwise the cloth will "give," when extension is made upon it, thus loosening the plaster from its "hold" upon the member.

Generally narrow strips are employed in supporting wounded parts, but those from one to two inches in width when compression or extension is desired.

After the strips have been cut, they should be heated, by placing the back of the plaster to a tin vessel containing hot water, or to the stove-pipe, before applying to the limb. They will "take hold" much better by so doing. If the part to which they are to be applied is *hairy*, a "clean shave" will be necessary before you can make a satisfactory application, and will save much trouble and pain when you come to remove them.

In removing adhesive strips from a wound that is uniting, care should be exercised lest you pull the lips of the wound asunder. If you support the wound with your finger, and remove each end of the strip *up to*, and not crossing over, the uniting line of the divided structures, you will reduce this danger to a minimum.

The portion of the plaster adhering to the limb, after the strips have been removed, is best cleaned off by first rubbing with olive oil, vinegar, or turpentine, and then washing away with soap. The surgeon's fingers are readily cleansed in the same way.

Oftentimes you will find the plaster discolored when applied to a suppurating member. This is owing to a decomposition of the lead in the plaster, due to the action of the secretions upon it.

STRAPPING FOR THE FOOT AND ANKLE.

Application. — Having cut your strips one or one and one-half inches in width, and of sufficient length to cross over the end first applied, as you see in the figure, you place the centre of the strip over the back of the heel, and bring one end, 1, down firmly, and somewhat forcibly, to the 5th meta-

Fig. 128.

For the Foot and Ankle.

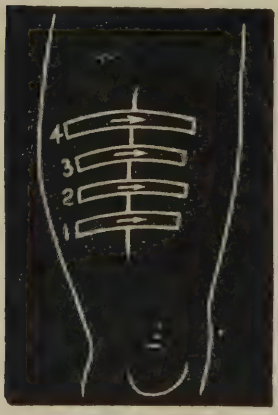
tarso-phalangeal articulation. Then seize the opposite end of the strip, and bring it equally firmly down over the tarsus, 2, to the 1st metatarso-phalangeal articulation. The other strips, 3, 5, and so on, are applied in a similar figure-of-8 manner, having care to overlap each preceding one a portion of its width. You will find you can exercise almost any amount of pressure by adhesive strips so laid, and care should be used lest you interfere too much with your patient's comfort, and so have to take them off before their therapeutical effect may be accomplished.

Variety.—Any portion of the body, when compression is desired, is wrapped in a similar figure-of-8 style, ulcerated surfaces being included in the strappings. It is really surprising the way some chronic (especially varicose) ulcers will improve after a week's treatment of good and vigorous strapping, although at the time of their application they may be somewhat painful to the patient.

FOR WOUNDS.

Application. — Having your strips cut of the requisite

Fig. 129.



For Superficial Cuts.

Fig. 130.

For Deep Cuts.

length (if the wound be not deep they need not surround the limb, but if the cut be to the bone, large enough to a little more than encircle the limb), you begin at the bottom of the wound (1, in figures 129 and 130) to apply them, the lips being held approximated by an assistant. The first strip having been applied, you follow in the same manner with the remaining ones, having care not to overlay either angle of the wound, or to apply them so closely that pus will not have a free escape. Some surgeons prefer to suture the lips of the wound, and then apply the plaster-strips between the sutures. But if the form of strapping represented in Fig. 130 be used, sutures will be rarely needed.

Another, and perhaps better, way for drawing together the lips of a wound, is shown in Fig. 131. This method has the advantage of doing away with sutures, and will hold the lips of the wound firmer than will narrow strips of adhesive plaster. It is made from the perforated adhesive plaster, and was first suggested by Dr. Packard, of Philadelphia. It leaves the lips of the wound fully open to inspection, and in no manner interferes with getting union by "first intention;" hence, on this account, it is to be commended.

Fig 131.

For Deep or Superficial Cuts.

In deep wounds, such as of the thigh, however, it would be best to have the plaster nearly surround the limb, in order that compression could be exerted upon the severed muscular structures as deeply down as possible.

FOR THE TESTICLE.

Application.—Having the parts shaven, have your patient stand against the edge of a table, or with his back to the wall,

Fig. 132.

For the Testicle.

keeping the legs separated. You then seize the diseased testis with your left hand, separating it from its fellow, and press it as far as possible into the scrotal sac, thus making its coverings as tense as may be. A short roller, having a width of one-half or three-quarters of an inch, wound three or four times about the upper portion of the scrotum, encroaching somewhat upon the epididymis, as 1 in the wood-cut, thus confining the testis. This roller is then fastened by a short piece of the adhesive plaster. You then pass the strips 2 and 3 (which are one-half or three-quarters of an inch in width, and long enough to go perpendicularly around the gland), completely around the testis, beginning them at, and *upon*, the previously applied roller, and ending them there. This should be continued until the whole organ has been thus enwrapped. Then, taking long pieces of strapping, one-half an inch in width, encircle the gland spirally from the bottom, 4, 5, to the top, overlapping each preceding turn, finishing them over the roller that was first applied.

Uses.—In chronic enlargements of the testis, or in some cases of hydrocele. After a day or two's application the organ will be found to have shrunken; then the dressing is to be removed, and re-applied.

Variety.—See page 125, upon the *tubes caoutchouc vulcanisé* of Nélaton. The *capote* is also made a legitimate use of in these cases. In both instances the roller, 1, is to be applied before the rest of the dressing. The ring of the capote should rest upon the applied roller.

FOR THE BREAST.

Description.—The strips having been cut to a width of one and one-half or two inches, and a length of some thirty inches, they are ready for

Application.—The Mamma being supported by an assistant you fasten one end of the strip over the spine of the scapula of the diseased side, and bring it down under the same axilla, and then pass it diagonally upwards across the chest, encroaching upon the gland, to and over the opposite shoulder, there ending; you thus follow course 13 of the Cross of One Mamma figured upon page 88. The other strips should be applied in a similar manner, only encroaching upon the gland more and more, until the necessary support has been given.

If *compression* is desired, cross strips can be run diagonally downwards across the chest, from over the shoulder of the diseased side to the hepatic region.

An American surgeon has taken advantage of the expansibility of sponge in maintaining compression of the mamma. The sponge (a large one) is thoroughly cleansed and impregnated with some antiseptic, and then pressed between two flat surfaces until it becomes dry, and as flat as possible. It is then firmly strapped or bound upon the breast with some one of the breast bandages which have been described, and is gradually made to expand by moistening with water, if the secretions from the gland or sore be not sufficient for this purpose. (See pages 88–89.)

Uses.—As a support of an inflamed or hypertrophied breast. Also, when compression is used, as a therapeutic agent in the treatment of any of the various forms of abscess that may arise within or about the gland.

FOR EXTENSION OF THE LEG.

FIG. 133.

Extension of the Leg.

Description.—I. Two broad and somewhat tapering perforated adhesive plaster strips (Grosvenor & Richards), of a length sufficient to reach from above the knee-pan to below the foot, and tie.

II. Several narrow strips of the same material to surround the limb when the strips are applied.

Application.—The broad strip, A–B, is applied to the side of the leg, while its fellow is made to do similar service upon the other side of the member. The narrow adhesive strip, C, is then applied about the leg as a confiner. The inferior ends, B, of the two side strips are then tied together, and a wedge of wood, a little longer than the foot is wide, is placed within the noose, to which the weight is attached. The wood is used to prevent the chafing and constriction of the foot, which would otherwise occur from the bringing together of the two inferior ends of the extending strips, as soon as the weight was attached.

Uses.—In cases of fracture where extension is demanded. Also in chronic arthritis, and for overcoming vicious contractions of muscles or tendons.

Variety.—This dressing may be applied to the upper extremity, though an occasion rarely calls for its use there.

NOTE.—Be sure to have the extension strips of sufficient length to reach ABOVE the knee-joint, otherwise you will be apt to stretch the joint-ligaments if your extension is long continued.

A NEW EXTENSION APPARATUS.

Some French surgeon, whose name we have just now forgotten, has ordered the following apparatus for making extension upon the foot. It is a rubber bag, shaped as you see in the cut, that surrounds the leg at the astragalo-tibial articulation, with wires in the two ends for fastening the extension-cord. At the back part is a stop-cock and tube for inflating the bag with hot or cold water, or air, as the case may be.

We should think this an excellent apparatus for maintaining

extension in hip-joint cases, the counter extension being made on a somewhat similar plan, that of a narrow rubber-bag (rather than tube), which could have a stop-cock attached admitting fluids, or air, and this passed over perinæum and groin, and the ends ringed so as to be easily attached to the extending cord running to the head of the bed.

Fig. 134.

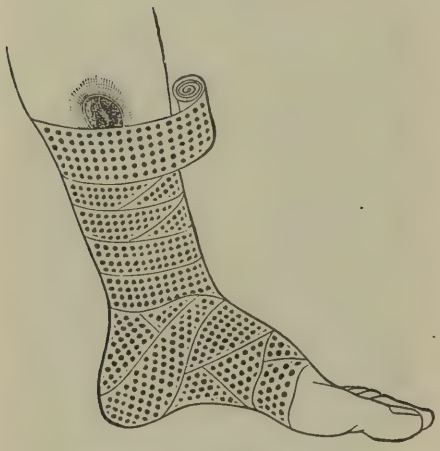
For Extension of Leg or Arm.

The advantage in the rubber being that it does not make a "dead" traction; but by its extension and self-contraction it simulates the resiliency of animal tissue. Another feature is that hot or cold water could be used, thus stimulating the capillary circulation, if used alternately; and in other ways it might be beneficial, especially about the ankle joint, in case continuous cold or hot applications might be deemed useful. The water, or air, would tend to equalize pressure, and so prevent any undue pressure upon the resisting points of the ankle and foot.

STRAPPING FOR VARICOSE ULCERS.

Having taken sufficient of the porous adhesive bandage, mentioned several times before in this work, to enable you to properly envelop the affected member, it is to be applied with quite firm pressure about the limb, as shown in Fig. 135. The turns of the bandage about the member are to be made as if you were applying the ordinary "roller" bandage.

FIG. 135

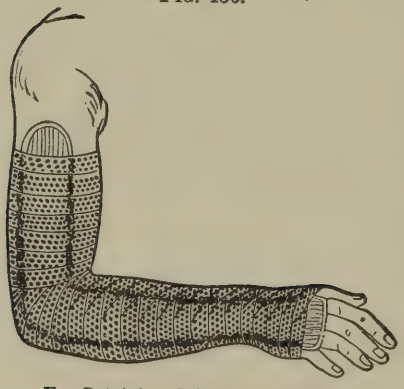


Strapping for Varicose Ulcers.

This porous adhesive bandage is specially applicable, in these cases, as it furnishes a means of firm support to the dilated veins, at the same time it is easily and evenly applied. Then, too, the porosity of the bandage allows for a certain amount of transpiration from the skin beneath, and also for the discharge from the ulcer itself.

ADHESIVE BANDAGES FOR RETAINING SPLINTS.

FIG. 136.



For Retaining Splints to Members.

Another useful application of the adhesive plaster, cut into proper widths, or for the perforated adhesive bandage, before spoken of, is in retaining the various forms of splints, and other stiff dressings, to a member.

Fig. 136 represents the "bandage" so applied to an "arm splint" where there has been a fracture, or dislocation. The perforated bandage is to be preferred to the plaster strips, as it is non-adhesive to the integument, yet adheres firmly to itself. Then, too, the pores allow of proper transpiration from the skin.

GENERAL DIRECTIONS FOR MEDICATED PLASTERS.

Before applying a medicated plaster, the part, if covered by long hair, should be closely clipped, and made thoroughly clean and dry. After removing the face-cloth (which may be readily done by moistening it, if it sticks strongly to the adhesive surface, and, afterwards made dry), the plaster should be well smoothed on, so as to conform accurately to any inequalities, observing that there is no air confined underneath.

The back-cloth on cut plasters is designed to protect the patient's underwear, therefore should not be removed.

To Remove a Plaster.—This is best done by taking it from off the part *quickly*, rather than by dragging at it slowly, or pulling it off piecemeal.

A plaster should never be worn longer than to obtain the desired result.

The different plasters may be kept to best advantage as follows:

India rubber plasters should be kept cool.

Isinglass plasters must be kept in an ordinary temperature, as moisture and extreme heat soon spoils them.

Kid plasters and emp. adhæsivum keep well in moderate temperature free from extreme changes.

Mustard and spice must be kept dry, as dampness soon spoils them.

CHAPTER XIII.

KNOTS.

Ligatures were introduced to the profession by Ambroise Paré. Previous to his time the "actual cautery," or the cautery of boiling oil, was made use of for arresting hæmorrhage. Ligatures are confined by knotting their extremities closely down upon the divided vessel they surround. Various styles of knots are employed, though we shall limit ourselves to a description of but three.

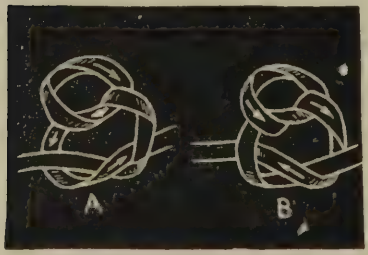
THE SURGEON'S KNOT.

Description.—This is formed by passing one extremity *twice* about the other, in making the noose ; and hence makes a more bulky knot. Sometimes the first knot of a ligature is the common single knot, and then the surgeon's knot is made, thus securing it. The objection to this knot is its bulkiness, though it is in quite common use with some operators.

THE REEF KNOT.

Description.—This is the ligature knot in general use among surgeons for arresting hæmorrhage.

FIG. 137.



The Reef and "Granny" Knots.

A "Granny" knot, B, is quite frequently made for the Reef, A, through inattentiveness of the surgeon; and students almost invariably make it on their first trial of the Reef. It is not a really bad knot; yet it lacks the firmness and surety of the Reef. The Reef knot, A, is made by first

crossing the ends of the ligature so that the one held by the right hand shall be uppermost. You then pass the right extremity around that held in the left hand, from within outwards; this makes the first knot, which is pressed firmly down to, and drawn constrictingly around, the vessel, by the *finger tips.* You then cross the ends again, so that the extremity that was held by the right hand, when making the first knot, shall *still be uppermost,* although consigned to the keeping of the left hand. The second knot is then made by passing the end now held by the right hand (formerly held by the left) around the other extremity, from without inwards, then drawing it closely down to its fellow by the finger tips again, thus completing the knot as a whole.

The secret in avoiding the Granny knot, B, is in keeping the uppermost end of the first knot still uppermost when making the second one.

In pulling the ends of the ligature, to tighten the knot, always have the direction of the force *downwards, or towards the vessel.* You will thus avoid jerking the noose from the vessel should the fingers slip from the thread, or the thread break.

CLOVE-HITCH KNOT.

Description —A strong crash towel is about as good as anything for making this knot. Previous to its application the part over which it is to be applied should be enveloped with a wet piece of lint; this serves the double purpose of protecting the limb from excoriation, and of preventing the slipping off of the knot from the extremity when making traction.

FIG. 138.

Clove-hitch Knot.

Application.—Place one of the extremities of the towel, or cravat, over the back of the forearm, for example, as at 1; pass now the other extremity down across the arm, and up over (diagonally from below upwards) the one first applied, as at 2. As-

cend the arm a little space, and then make another horizontal turn about it, bringing the end up under the course 2, thus finishing course 3.

Uses.—For extension of a member during reduction of a dislocation; more especially applied to the superior extremity.

M. GERDY'S EXTENSION KNOT.

Description.—This knot is executed with a cravat one and one-half yards in length; the length, however, varying according to the purposes for which it is employed.

Application.—Place the centre of the cravat upon the tendo Achillis, just above the ankle joint, having the dorsal surface of the foot towards you; then bring the two extremities of the cravat forwards, crossing them upon the front of the tibio-tarsal articulation, 1′; carry the two ends downwards to the plantar surface of the foot, recrossing them to carry them up, 2, 2′, in front of the malleoli, and under the crossed extremities 1, 1′; then bring them downwards, as 3, 3′, to fasten as required.

Fig. 139.

M. Gerdy's Extension Knot.

Variety. — Instead of putting the courses 2, 2′, beneath the crossed extremities, 1, 1′, from below upwards, carry them up across these courses, and pass them, from above downwards, beneath the courses 1, 1′; afterwards make a final fastening as desired.

See, also, Figs. 133 and 134, when extension is to be kept up for any great length of time.

Uses.—For extension of the lower extremity, as in dressing fractures; the counter extension being made by the perinæal band, or inclination of the bed.

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